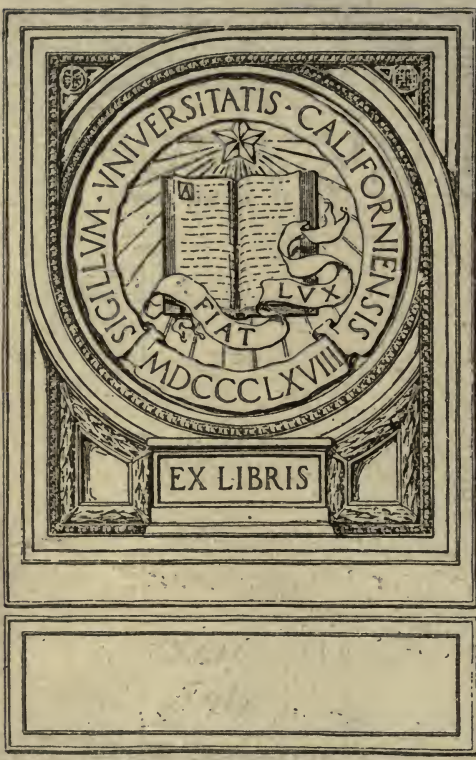


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# AN INTRODUCTION TO TOWN PLANNING.

A Handbook Dealing with the Principles of the  
Subject and a consideration of the Problems  
Involved, Powers of Local Authorities, &c.

BY

JULIAN JULIAN, B.E.,

BOROUGH SURVEYOR, CAMBRIDGE.

*With Appendices on Garden Cities and Garden Suburbs,  
Schedule of Town Planning Act, &c.*

With Diagrams and Plans.



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TO ALL  
MEMBERS

## PREFACE.

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THE passing of the Housing, Town Planning, etc., Act of 1909 has opened out vast possibilities for Local Authorities, landowners, and town dwellers generally.

Until then the Local Authorities had been powerless to control the character of a town's growth, or even to decide the direction of a new street ; while a landowner who might wish to lay out his estate on healthy, convenient, and pleasant lines might find his schemes thwarted and his estate spoiled by the action of a neighbouring landowner with other and perhaps less beneficent ideas.

Now, under the Act, there are opportunities for many persons to confer as to the development of a town, so that a scheme may be evolved for regulating its future growth. Not only Town and District Councils and the landowners, but also the Architectural and Antiquarian Societies, and those interested in Social Service, may have some part in these conferences, and it is hoped that this little book will be of use to very many who take a general interest in the subject of town planning, as well as to some who may be more directly engaged in the preparation and consideration of schemes under the Town Planning Act.

The book is not so much a guide to the Act of Parliament as an attempt to deal with the principles of town

planning, to indicate some of the subjects to be investigated, and to suggest some of the problems to be solved.

It will be seen that Town Planning is not a new thing, nor is it a German invention.

In the earlier chapters there are many quotations from classical and other writers, for I wished to emphasize the fact that some of the problems of town planning have been considered ages ago ; some were solved in general terms, some received solutions which held good under the particular circumstances, while other difficulties remain for us to overcome.

We ought to study many towns before we attempt to lay out a new one ; we ought to study our own town very carefully before we plan its extensions. The habits of the people, the levels of the ground, the nature of the soil, the meteorological conditions, the cost of materials, the industries of the neighbourhood, the size of the estates, the opportunities of land purchase, and, beside these, the history and traditions of the place all need earnest consideration before the plan is prepared. The very enumeration of these things suggests that it is not a work for one man, and although it is most desirable that the town plan should be a unity, an entity with definite character, and not a soulless aggregation, yet under modern conditions it is probable that the best results will be obtained by a group of workers, each doing his share, and all seeking the common good.

J. J.

CAMBRIDGE, *July*, 1914.



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# TOWN PLANNING.

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## CHAPTER I.

### ANCIENT TOWN PLANNING.

Early Growth of Rome—Rebuilding after the Gallic Fire and in Nero's Time—Vitruvius' Treatise on Town Planning—Athens and the Piræus—Themistocles and Hippodamus—General Notes on Ancient Buildings, Streets, and Towns—Roman Towns in Britain—Winchester and Colchester.

**Early Growth of Rome.**—Historical investigation has long shown us that many of the legends of ancient Rome are unworthy of credence; that sometimes the true story has been lost by the accidents of time, and sometimes it has been concealed by the patriotic design of those who did not wish to publish the failures of their fathers.

On the other hand, archæological research in recent years has made it plain that in very early days there was a settlement among the Roman hills of which we have no history whatever.

Although the Romans liked to think of the antiquity of their race, and to claim a divine origin for it, they looked upon a certain stage in their history as a starting point for all their chronology, and while other nations might record the building or rebuilding of their capitals as taking place in a particular year of some King's reign, Rome, the eternal city, proudly set the standard by her birthday, and, for centuries, the events of the civilized

world were described as taking place in such and such a year after the foundation of the city.

It, therefore, seems appropriate that, before considering any modern activities and studies, we should take a brief glance at what Roman historians have told us about the early development of their city on the seven hills.

Livy tells us in his preface that "the traditions which have come down to us before the building of the city, or before its building was contemplated, as being suitable rather to the fictions of poetry than to the genuine records of history, I have no intention to affirm or refute," and while we may feel a measure of doubt concerning some of the traditions which Livy has thought fit to record, there are many of his statements which are instructive as indicating some of the early ideas, difficulties, mistakes, and successes of the Romans in their town planning.

One of Livy's first remarks bearing directly on our subject is that "they built rather with a view to future numbers than for the population which they then had," and as we peruse his history we learn how the city grew. Sometimes the boundaries were extended because of the increase of population or for military reasons, while at other times special measures were adopted to attract people to the city, or to some new quarter of the city.

Immediately after the Albans removed to Rome we find the increase of population and the extension of the city boundaries recorded in the same paragraph. "In the meantime Rome increases by the demolition of Alba. The number of citizens is doubled. The Cœlian mount is added to the city, and, in order that it might be inhabited more populously, Tullius selects that situation for his palace, and there took up his abode . . . and as a consecrated place of meeting for the patrician order augmented by him he built a senate house."

This was not the only time when the royal residence attracted the fashionable Roman, for in the reign of Servius Tullius when the increase in population led to another city extension, "he adds two hills, the Quirinal and Viminal; then in continuation he enlarges the



Esquilæ, and takes up his own residence there, in order that respectability might attach to the place."

Nevertheless, the presence of a powerful neighbour had not always this happy result, for, when P. Valerius built a house on the summit of Mount Velia, an unfortunate rumour got abroad that he aspired to the crown, and was building a fortress which might command the lower levels. Publius, hearing this report, declared "the house of Publius Valerius shall not stand in the way of your liberty, Romans; the Velian mount shall be secure to you. I will not only bring down my house into the plain, but I will build it beneath the hill, that you may dwell above me, a suspected citizen."

In much the same way as the Romans were afraid that Valerius was building a fort rather than a house, so the neighbouring states for a long time looked upon Rome as a camp rather than a city. This suspicion was more or less removed when the Romans began to build temples and established religious institutions. Later on we find that Servius Tullius "endeavoured to extend his empire by policy, and at the same time to add some ornament to the city. The Temple of Diana at Ephesus was at that time in high renown; fame represented it to have been built by all the states of Asia in common. . . . Servius at length prevailed so far that the Latin states agreed to build a temple to Diana at Rome, in conjunction with the Roman people."

While the erection of temples resulted in adding ornament to the city and encouraging some friendly intercourse with the Italian peoples, there were public works still more essential for the Romans themselves. A senate house and a prison, the city walls and a bridge are duly recorded, while some of the great sewers remain to this day. Tarquin the Proud, the last King of Rome, was a great director of public works, and, "having sent for workmen from all parts of Etruria, employed . . . not only the public money, but the manual labour of the people; and when this labour, by no means inconsiderable in itself, was added to their military service

still the people murmured less at their building the temples of the gods with their own hands ; they were afterwards transferred to other works, which, while less in show, required still greater toil, such as erecting benches in the circus, and conducting underground the principal sewer, the receptacle of all the filth of the city ; to which two works even modern splendour can scarcely produce anything equal."

These remarks about the manual labour and military service of the people might well suggest an enquiry as to whether any system of rating had been introduced. Livy tells us something about this under the reign of Servius Tullius who "instituted the census, a most salutary measure for an empire destined to become so great, according to which the services of war and peace were to be performed, not by every person indiscriminately as formerly, but in proportion to the amount of property."

One other point of note is with regard to the "Pomœrium." We read that Servius Tullius "surrounded the city with a rampart, a moat, and a wall ; thus he enlarges the pomœrium. They who regard only the etymology of the word will have the pomœrium to be a space of ground without the walls, but it is rather a space on each side of the wall, which the Etrurians in building cities consecrated by augury, reaching to a certain extent both within and without in the direction they intended to raise the wall ; so that the houses might not be joined to it on the inside, as they commonly are now, and also that there might be some space without left free from human occupation. This space which it was not lawful to till or inhabit, the Romans called the pomœrium not for its being without the wall, more than for the walls being without it ; and in enlarging the city, as far as the walls were intended to proceed outwards, so far these consecrated limits were likewise extended."

Just contemplate the possibilities in this idea of a pomœrium, so carefully explained by Livy. Slightly change the regulations for this religious and military air space, and we see the germ of those circular roads,



boulevards, ringstrassen, promenade rings, or parkways, which we should be so glad to have in many of our modern cities.

**Rebuilding after the Gallic Fire and in Nero's Time.**—After a great fire or earthquake or siege a city sometimes has the chance of reviewing its former growth, and, in the light of experience, choosing a plan for its reconstruction and future development. But a ruined people, a crowd of homeless individuals, may well be forgiven if the opportunity is not always seized. Rome in classic times was twice burned, once in the time of Camillus and again in the time of Nero. Two chapters at the end of Livy's fifth book tell the story of the former of these occasions. First, there is the speech of Camillus who makes some remarks on the choice of a site for a city, and dissuades the people from leaving Rome and migrating to Veii; then we have an account of the rebuilding, with some indications of the disadvantages of a hurried rebuilding without any definite plan.

Camillus says, "Not without good reason did gods and men select this place for founding a city, these most healthful hills, a commodious river, by means of which the produce of the soil may be conveyed from the inland countries, by which maritime supplies may be obtained; close enough to the sea for all purposes of convenience, and not exposed by too much proximity to the dangers of foreign fleets; a situation in the centre of the regions of Italy, singularly adapted by nature for the increase of a city. The very size of so new a city is a proof. Romans, the present year is the three hundred and sixty-fifth year of the city . . . Here is the capitol . . . Here is the fire of Vesta, here the Ancilia sent down from heaven, here are all the gods, propitious to you if you stay."

Then when the people decided to stay and to rebuild the city we read, "The building of the city commenced in several parts at once. Tiles were supplied at the public expense. The privilege of hewing the stone and felling timber, wherever each person wished, was granted,

security being taken that they would finish the buildings in that year. Their haste took away all attention to the regulating the course of the streets, whilst setting aside all distinction of property, they build on any part that was vacant. That is the reason why the ancient sewers, at first conducted through the public streets, now in many places pass under private houses, and why the form of the city appears more like one taken up by individuals than regularly portioned out by commissioners."

Various extensions and improvements were carried out in the city and to its buildings during the next four centuries, and notably in the time of Augustus, who boasted that he had found Rome brick and left it marble.

The next great period of town planning, as distinguished from the erection of great buildings was in the time of Nero. Both Suetonius and Tacitus give detailed accounts of his proceedings, but it does not seem necessary to reproduce the records in full.

Suetonius says that Nero "being offended, as it were, with the ill-favoured fashion of the old houses, as also with the narrow, crooked, and winding streets, he set the city of Rome on fire so apparently, that many citizens of consul's degree, taking his chamberlains in the manner with matches, touchwood, and hurds in their messuages, within the city, would not once lay hand on them, but let them alone."

Tacitus does not appear quite so confident that it was Nero's anxiety to carry out a town-planning scheme which led to the burning of Rome, but his lengthy account gives many interesting details as to the crowded buildings, the narrow streets of the old city, the more orderly arrangements for protection against fire, and for promoting the public health in the new city.

"There followed a dreadful disaster, whether fortuitously, or by the wicked contrivance of the prince, is not determined, for both are asserted by historians; but of all the calamities which ever befel this city from the rage of fire, this was the most terrible and severe.

It broke out in that part of the Circus which is contiguous to Mount Palatine and Cœlius, where, by reason of shops, in which were kept inflammable goods, the moment it commenced it acquired strength, and being accelerated by the wind, it spread at once through the whole extent of the Circus; for neither were the houses secured by enclosures, nor the temples environed with walls, nor was there any other obstacle to intercept its progress; . . . it baffled every effort to extinguish it, by the rapidity of its destructive course, in consequence of the narrow and intricate alleys, and the irregularity of the streets in ancient Rome. . . . Neither dared any man offer to check the fire; so repeated were the menaces of many who forbade to extinguish it; and because others openly threw firebrands with loud declarations 'that they had one who authorized them.' . . . For the relief of the people, thus destitute and driven from their dwellings, Nero opened the field of Mars, and the monumental edifices erected by Agrippa, and even his own gardens. He likewise reared temporary houses for the reception of the forlorn multitude . . . . At length, on the sixth day, the conflagration was stayed at the foot of Esquilæ, by pulling down an immense quantity of buildings, so that an open space, and, as it were, void air, might check the raging element by breaking the continuity. But ere the consternation had subsided, the fire broke out afresh, with no little violence, but in regions more spacious, and therefore with less destruction of human life, but more extensive havoc was made of the temples and the porticoes dedicated to amusement. This conflagration, too, was the subject of more censorious remark, as it arose in the Aemilian possessions of Tigellinus; and Nero seemed to aim at the glory of building a new city, and calling it by his own name. . . . It were no very easy task to recount the number of tenements and temples which were lost . . . . Moreover, the treasures accumulated by so many victories, the beautiful productions of Greek artists, ancient writings of authors celebrated for genius, and till then preserved

entire, were consumed ; and though great was the beauty of the city in its renovated form, the older inhabitants remembered many decorations of the ancient which could not be replaced in the modern city. . . .

“Nero appropriated to his own purposes the ruins of his country, and founded upon them a palace, in which the old-fashioned, and, in those luxurious times, common ornaments of gold and precious stones were not so much the objects of attraction as lands and lakes ; in one part, woods like vast deserts ; in another part open spaces and expansive prospects. The projectors and superintendents of this plan were Severus and Celer, men of such ingenuity and daring enterprise as to attempt to conquer by art the obstacles of nature, and fool away the treasures of the prince. . . .

“But the rest of the old site not occupied by his palace was laid out, not as after the Gallic fire, without discrimination and regularity, but with the lines of streets measured out, broad spaces left for transit, the height of the buildings limited, open areas left, and porticoes added to protect the front of the clustered dwellings ; these porticoes Nero engaged to rear at his own expense, and then to deliver to each proprietor the areas about them cleared. He, moreover, proposed rewards proportional to every man’s rank and private substance, and fixed a day within which, if their houses, single or clustered, were finished, they should receive them ; he appointed the marshes of Ostia for a receptacle of the rubbish, and that the vessels which had conveyed grain up the Tiber should return laden with rubbish ; that the buildings themselves should be raised to a certain height without beams, and arched with stone from the quarries of Gabia or Alba, that stone being proof against fire ; that over the water springs, which had been improperly intercepted by private individuals, overseers should be placed to provide for their flowing in greater abundance, and in a greater number of places for the supply of the public ; that every housekeeper should have in his yard means for extinguishing fire ; neither should there be party



walls, but every house should be enclosed by its own walls. These regulations, which were favourably received in consideration of their utility, were also a source of beauty to the new city ; yet some there were who believed that the ancient form was more conducive to health, as from the narrowness of the streets and the height of the buildings the rays of the sun were more excluded ; whereas now the spacious breadth of the streets without any shade to protect it was more intensely heated in warm weather."

It would be interesting to know if Nero or his architects, Celer and Severus, had studied any writers on the subject of town planning. From the preceding quotations we may assume the principal points attended to in the rebuilding of the city were as follows:—The narrow, crooked streets gave way to broad, straight streets with open spaces ; the rebuilding of the palace was one of the first considerations, this forming an imperial centre surrounded with examples of landscape gardening ; the height of private buildings was limited, and to a certain height they were made fire-resisting ; each building, whether detached or clustered, had to have independent and not party walls ; there was a public water supply provided, but each house had its own fire-appliances ; porticoes or porches to private houses were built at the expense of the prince, who also appears to have given prizes to those who promptly rebuilt their houses on the new lines.

**Vitruvius' Treatise on Town Planning.**—More than one Greek architect had written on town planning, and Hippodamus of Miletus had laid out towns in Italy which had already passed away, but there was a Roman architect, or perhaps more correctly a military engineer, whose writings on architecture included notes on town planning, and, although we know little of the life of Marcus Vitruvius Pollio, we still have his books, which were written in the reign of Augustus, and appear to have been to a considerable extent based on studies of Greek architecture and planning.

It is chiefly in Vitruvius' first book that we get his ideas on town planning, although in the introduction to Book II. he tells us something of the architects of his day, and of the way in which, at a still earlier period, a Greek architect secured the commission to plan the city of Alexandria.

"In setting out the walls of a city the choice of a healthy situation is of the first importance; it should be on high ground, neither subject to fogs nor rains; its aspects should be neither violently hot nor intensely cold, but temperate in both respects. The neighbourhood of a marshy place must be avoided; for in such a site the morning air, uniting with the fogs that rise in the neighbourhood, will reach the city with the rising sun; and these fogs and mists, charged with the exhalation of the fenny animals, will diffuse an unwholesome effluvia over the bodies of the inhabitants, and render the place pestilent. A city on the sea side, exposed to the south or west, will be insalubrious; for on summer mornings, a city thus placed would be hot, at noon it would be scorched. A city also with a western aspect would even at sunrise be warm, at noon hot, and in the evening of a burning temperature. . . . Much care, then, should be taken so to set out the walls of a city that it may not be obnoxious to the pestilential blasts of the hot winds.

"When . . . a city is built in a marshy situation near the sea coast, with a northern, north-eastern, or eastern aspect, on a marsh whose level is higher than the shore of the sea, the site is not altogether improper; for by means of sewers the waters may be discharged into the sea.

"The old city of Salapia in Apulia, built, as some say by Diomedes on his return from Troy, or as others write, by Elphias the Rhodian, was so placed that the inhabitants were continually out of health. At length they applied to Marcus Hostilius, and publicly petitioned him, and obtained his consent to be allowed to seek and select a more wholesome spot to which the city might be

removed. Without delay and with much judgment, he bought an estate in a healthy place close to the sea, and requested the Roman senate and people to permit the removal of the city. He then set out the walls, and assigned a portion of the soil to each citizen at a moderate valuation, after which, opening a communication between the lake and the sea, he converted the former into an excellent harbour for the city. Thus the Salapians now inhabit a healthy situation four miles from their ancient city.

“When we are satisfied with the spot fixed on for the site of the city, as well in respect of the goodness of the air as of the abundant supply of provisions for the support of the population, the communications by good roads, and river or sea navigation for the transport of merchandise, we should take into consideration the method of constructing the walls and towers of the city. . . .

“Their circuit being completed, it behoves us to consider the manner of disposing of the area of the space enclosed within the walls, and the proper directions and aspects of the streets and lanes. They should be so planned as to exclude the winds; these, if cold, are unpleasant; if hot, are hurtful; if damp, destructive. A fault in this respect must be, therefore, avoided, and care taken to prevent that which occurs in so many cities. For instance, in the island of Lesbos the town of Mytilene is magnificently and elegantly designed and well built, but imprudently placed. When the south wind prevails in it, the inhabitants fall sick, the north-west wind affects them with coughs, and the north wind restores them to health, but the intensity of the cold therein is so great, that no one can stand about in the streets and lanes.

“Let the directions of the streets and lanes be determined by the tendency of the lines which separate the different regions of the winds. Thus will their force be broken and turned away from the houses and public ways; for if the direction of the streets be parallel to those of the winds, the latter will rush through them with greater violence. . . .



“The lanes and streets of the city being set out, the choice of sites for the convenience and use of the state remains to be decided on; for sacred edifices, for the forum, and for the public buildings. If the place adjoin the sea, the forum should be seated close to the harbour; if inland, it should be in the centre of the town.”

Vitruvius in Books II. and VI. lays stress upon the need for considering differences of materials and climates when designing houses, and points out that “the method of building which is suited to Egypt would be very improper in Spain, and that in use in Pontus would be absurd at Rome; so in other parts of the world, a style suitable to one climate would be very unsuitable to another.”

Such remarks, although made by Vitruvius with respect to the construction of houses, appear equally applicable to the planning of towns.

**Athens and the Piræus.**—A few notes must be given with reference to Athens and one of the great town planners of Greece, although the direct influence of Rome on the planning of towns was far greater than that of any Greek cities. Greek architects might show greater delicacy in the details of their public buildings and might elaborate more scientific methods of laying out their towns, yet the few general principles which the Romans gradually learned by their own experience, influenced undoubtedly by that of Greece and the East, have left a marked impression upon the plans of Roman provincial towns and upon the main lines of the few mediæval cities where any systematic plan was followed.

**Themistocles and Hippodamus.**—In 478 B.C., after Athens had been twice burnt by the Persians within two years, Themistocles recognised that the city should have a new and regular plan, that it was desirable to have a new capital by the sea, and that a strong navy was needed, but as, on religious and other grounds, it was difficult to transfer or transform the capital he decided to found the port town of Piræus, to fortify it, and connect it with Athens. He then did all in his power to advance the

young town and to people it with useful inhabitants, even if, in some cases, they were foreign artisans and artists.

With a people in reduced circumstances, great energy was needed to persuade them to do anything more than provide for immediate necessities, and therefore little could be done toward beautifying the city at that time. Much, however, was done during the next half-century.

Dr. Curtius' history of Greece has one paragraph where he concisely contrasts the older Athens and the new city by the sea :—"While Athens, hastily rebuilt amidst her ruins, as necessity demanded, was disorderly, devoid of plan, and full of narrow and crooked lanes, the Piraeus, on the other hand, was a modern city, with large open spaces, roomy cloistered halls, broad and rectangular streets, in its entirety a work of art, the creation of Hippodamus, who had himself owned a house in the earlier Piraeus as an alien resident under the protection of the Attic state, but gladly sacrificed his property, when, at the instigation of Pericles, he received the splendid commission of rebuilding the entire port city within the walls built round it by Themistocles after the fashion of a colony and in accordance with the rules of art."

Some further notes on this remarkable town planner may be placed here. He was born at Miletus, and as an architect he desired to reform everything architectural according to definite principles. Houses and towns were not to be built according to individual fancy, nor were their plans to be influenced by the disposition of the ground. He considered that general principles should have full sway, and he demanded for a city absolute regularity of plan, with straight streets and squares; but this was not all, for "he desired to introduce a new habit of dress, he wished to have the civic communities regulated, the classes of the population divided off, and the laws and the public business settled according to fixed numerical proportions."

Thurii on the Gulf of Tarentum was one of the towns

constructed under his guidance in B.C. 443, and, here the existing circumstances being more favourable to the planning of a new city than at the Piraeus, we may assume that the town as planned was a fair example of the art of Hippodamus. The general lay out of the city may be described as four main streets running north and south intersected by four others which ran east and west. Something appears to have been done to divide the population into classes in accordance with the theories of the architect, but the period of the city's prosperity was only about 50 years, then its importance diminished, and the Thuri of the Augustan age was another town built near the site of this model Greek colony.

#### **General Notes on Ancient Buildings, Streets, and Towns.**

—Instead of seeking to follow the individual fortunes of other ancient cities it will probably be more useful to take a few important points connected with the growth of towns, and see how far the history of one or two ancient towns may afford us information on one point and another city may answer our questions on some other detail.

First, as to the choice of a site for a city, we have read in Vitruvius how the Salapians found that a difference of 4 miles in the situation of their town made a great improvement in the health of the people. There is a note in Herodotus which tells of the mistakes of another people in selecting a poor site when they might have had a better.

“Megabazus, by making the following remark, left an everlasting memorial of himself among the Hellespontines, for when he was at Byzantium he was informed that the Chalcedonians had settled in that country 17 years before the Byzantians; but when he heard it, he said, that the Chalcedonians must have been blind at that time, for if they had not been blind, they would never have chosen so bad a situation when they might have had so beautiful a spot to settle in.” Plutarch tells us of Alexander changing the position for his city of Alexandria in consequence of a dream, and also how the town was planned in the shape of a Macedonian cloak, but the

details given are somewhat fanciful. As to the streets of ancient cities, we find that while Athens and early Rome had narrow, crooked streets very often steep and ill paved, and even the luxurious city of Pompeii reveals many narrow streets, yet there were ancient cities with wide straight streets sometimes set out at right angles, and even flanked by imposing colonnades. Amongst them were Babylon, Alexandria, Palmyra, Gerasa, and some of the buried cities of Egypt, which have yielded up their secrets in recent years.

Another point of interest is with regard to the height of buildings and the closeness or openness of the general planning. Sometimes we are apt to think of high dwellings as the result of extravagant street works or modern by-laws, but while at Athens we read of the houses being small, low, and closely packed together, we find that in Babylon, in spite of its enormous area and extensive enclosed fields and gardens, the houses were generally three or four storeys high, that in Rome a height of five or six storeys was common, and both Augustus and Nero tried to limit the height of buildings to 70 feet, while in some of the Phœnician coast towns, such as Tyre, the houses were generally six to eight storeys in height.

If we enquire as to the materials commonly used we cannot do better than take the experience of Vitruvius, who says, "Each nation . . . has its own way of building, according to the materials afforded and the habits of the country. At Marseilles the roofs are covered with straw and earth mixed up together, instead of tiles. At Athens, even to this day, the Areopagus, an example of remote antiquity, is covered with clay; and the house of Romulus in the Capitol, by its thatched roof, clearly manifests the simple manners and habits of the ancients." We have already quoted Nero's building regulations and the remark of Augustus that he (Augustus) had found Rome brick, but left it marble. The Greeks used marble to a far greater extent than the early Romans, while the Babylonians seem to have used brick almost exclusively.



Alexandria was at one time supposed to be safe from fire, owing to the absence of wood beams, etc., which were replaced by stone and concrete.

A few lines from a most interesting book published about 50 years ago by Rev. J. L. Porter on the *Giant Cities of Bashan* may be quoted in connection with this part of our subject. He refers to his frequently spending the night in some long deserted town, and says, "How strange to occupy houses of which giants were the architects, and a race of giants the original owners! The temples and tombs of Upper Egypt are of great interest, as the works of one of the most enlightened nations of antiquity; the palaces of Nineveh are still more interesting as the memorials of a great city which lay buried for 2,000 years; but the massive houses of Kerioth scarcely yield in interest to either. They are antiquities of another kind. In size they cannot vie with the temples of Karnac, in splendour they do not approach the palaces of Khor-sabad; yet they are the memorials of a race of giant warriors that has been extinct for more than 3,000 years, and of which Og, King of Bashan, was one of the last representatives, and they are, I believe, the only specimens in the world of the ordinary private dwellings of remote antiquity." Earlier in his book Mr. Porter has described the houses in more than one city, and in one passage he says, "The houses of Bashan are not ordinary houses. Their walls are from 5 to 8 feet thick, built of large squared blocks of basalt; the roofs are formed of slabs of the same material, hewn like planks, and reaching from wall to wall; the very doors and window shutters are of stone, hung upon pivots projecting above and below. Some of these ancient cities have from 200 to 500 houses still perfect, but not a man to dwell in them."

The private houses of the Romans had no elaborate facades, they might have one or more rooms rich with art treasures, but toward the street there were often bare walls without windows. For all that, the streets often exhibited monumental public works and buildings, temples and theatres, baths and bridges, with here



and there a triumphal arch or a commemorative column.

The Romans learned at last that wide straight streets had certain advantages over the narrow tortuous alleys of their old capital, and to some extent they provided these straight streets in Rome, where the hills were sometimes levelled to enable straight streets to be more easily continued. To a still greater extent the Romans adopted straight streets and rectangular planning in their colonies.

**Roman Towns in Britain.**—We can find good examples of Roman influence in the planning of a number of English towns, but it is somewhat curious that we are without satisfactory records as to the dates or circumstances of foundation of some of the towns, such as Winchester and Colchester, where the material indications of Roman origin are most clear. Colchester was the first town which the Romans built in Britain, probably in 50 A.D., and we have some account of the buildings, the temple in honour of Claudius, and the statue of Victory, together suggesting one name of the town, “Claudiana Victricensis,” but although there were a senate house and a theatre there were no town walls, for Tacitus says, “they thought more of convenience than of safety.”

Possibly this neglect to fortify the town was the reason for the town being removed at some early, but unknown, date; at all events the town of Colchester, as we know it to-day, with its Roman walls and general plan, would seem to be built on a site which only to a small extent coincides with that of the original colony described by Tacitus.

If we refer to Winchester and examine the walls and general scheme of the city, we find ample evidence of Roman origin, but no Latin historian seems to have recorded its foundation. Its Roman name was *Venta Belgarum*, while the Venerable Bede gives its Germanic name as *Vintanceaster*.

Both Colchester and Winchester may be described as typical Roman towns laid out on the lines of a Roman

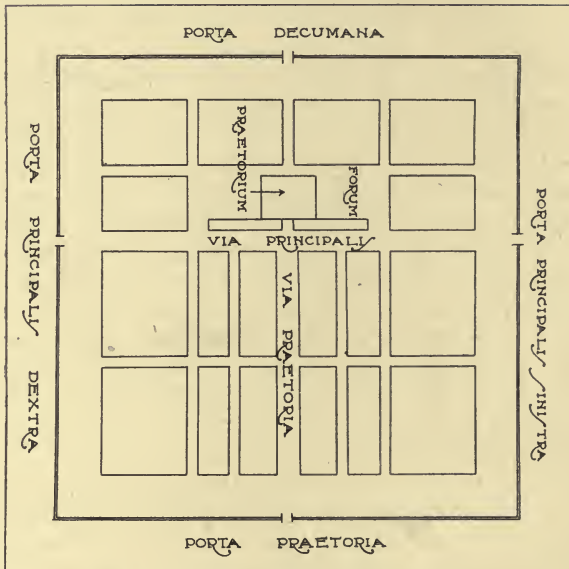


Fig. 1.—Typical Plan of a Roman Camp.

The arrangement of streets should be compared with that in the Plan of Winchester.

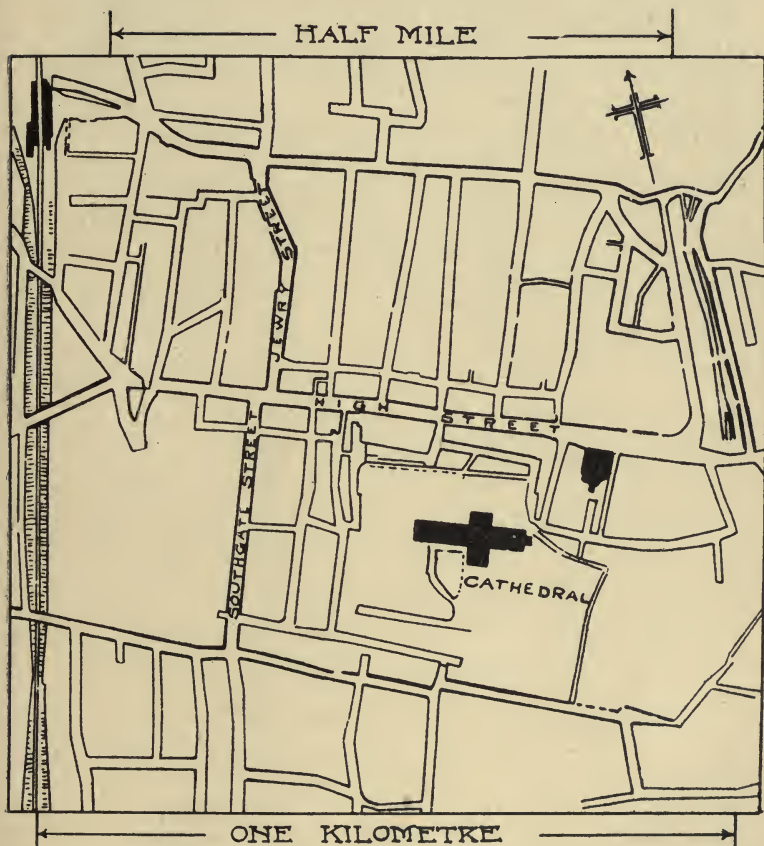


Fig. 2.—Plan of a Roman Town, Winchester.

The part of the city shown in the drawing is approximately on the lines of a Roman camp with three streets running east and west and other streets at right angles, including Southgate Street and Jewry Street, which probably represent the Via Principalis of the camp.

The plan suggests a city set out on formal lines which have gradually become irregular through encroachments and variations during 2000 years.

camp with an oblong area of 100 to 120 acres surrounded by a wall with a circuit of about 2 miles. The longer side ran east and west, and two main streets intersecting at right angles divided the town into four parts and led to four principal gates.

Other streets were parallel to these main streets, and there were one or more additional gates. The western gate at Colchester was abandoned, and another near the south-west corner came into use; but, generally, the four main gates were retained in Roman built towns, however many other gates were added.

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## CHAPTER II.

## MEDIÆVAL AND MODERN TOWN PLANNING.

Edward I. in Gascony and at Winchelsea—Palissy and Richelieu—Fire of London—Wren and Evelyn—St. Petersburg—Karlsruhe—Philadelphia—Washington and L'Enfant—The Past 100 Years in England—London—Birkenhead—Barrow-in-Furness—Report of 1842—Powers of Town Councils.

It is remarkable how few old towns there are in Europe where a definite geometric plan has been adopted for the entire area. Small districts are found planned on the rectangular or the radiating system, but these are generally modern developments, often the suburbs of towns whose old quarters are on very irregular lines. It must, however, be confessed that the history of towns laid out on some regular plan has not been uniformly encouraging. From one cause and another, often quite unconnected with their planning, the towns have been unfortunate. Leaving out of the question the great Oriental cities of antiquity we may note that the towns with which the name of Hippodamus of Miletus was connected had short, though eventful, histories. That great architect's work ranged from writing treatises on political economy to laying out towns on rectangular lines, but the Piræus, Thurii, Selinus, in spite of their scientific plans, quickly disappeared from the map.

**Edward I. in Gascony and Winchelsea.**—Then again our own Edward I. had numerous "Villes Anglaises" planned in Gascony, but where is one which has acquired fame? The one town he planned and which has at all events persisted, if it has not grown to any great size, is Winchelsea, but there he did not adopt a radiating or



concentric plan as in Gascony. He copied the plan of the old town which had grown up on a more or less definite rectangular system.

Edward I., before he came to the throne, was Warden of the Cinque Ports, and seems to have taken considerable interest in the fortunes of old Winchelsea, which had suffered greatly through the wars with France and in its conflict with the sea. Soon after becoming King he purchased a site as near as he could to the old town, and there planned out a new town like the old. He arranged for the people to take possession of the new town with its houses and churches, town walls, and gates, all modelled on the old rectangular lines, and had actually removed many of the people when, in 1287, the most terrible storm of the century swept away the old town so effectually that the exact position is scarcely known. The new town had a population of several thousands at its most flourishing period, but before A.D. 1500 its importance had gone and its population gradually diminished, until at the 1911 census there were only 101 inhabitants.

**Palissy and Richelieu.**—If we go on another stage we find two remarkable men, whose lifetimes just overlap, and who, in the course of very different occupations, found time to think of town planning. Bernard Palissy (1510-89), the Huguenot potter, was for a short time a land surveyor, and possibly this may have led him later on to dream of an ideal city on rectangular lines; while Cardinal Richelieu (1585-1642), who said that he employed all his energy to ruin the Huguenot cause, actually laid out a small town on the rectangular system, and, like the founders of so many ancient cities of so much larger size, he called it by his own name.

**Fire of London.**—While Europe was recovering from the religious and political wars of this period, and while the English and Dutch were taking and retaking that small town in the new world which has grown into the huge city of New York, we have nearer home a landmark in the history of town planning, an instance where town plans were prepared, but were not followed, a period

when a great opportunity was offered, but was not grasped, for, although improvements in detail were introduced in the rebuilding of London, those general schemes suggested by Christopher Wren, John Evelyn, and Robert Hooke were not made use of.

The great fire of London took place early in September, 1666, accounts of it being given by Pepys and Evelyn in their diaries. Within a few days of the fire three plans for rebuilding the city were submitted to the King,\* and, although none of them was adopted, both Wren and Hooke were employed for a large amount of the work of rebuilding.

While Wren and Hooke were official surveyors, John Evelyn had acquired some experience in architectural design and municipal administration, so that he was not entirely without qualifications in this matter.

We find in his diary many criticisms of towns and buildings which he visited. He mentions the general character of buildings as well as the great churches and abbeys; he describes the streets, wide or narrow, ill or well paved, clean or dirty. Then he had served on more than one public commission, such as that for "reforming the buildings, ways, streets, and incumbrances, and regulating the hackney coaches in the City of London." He had written on architecture, and had discussed the plans of public buildings not only with His Majesty's Surveyors, but also with the King himself. He was an old friend of Wren, and refers to "that incomparable genius, my worthy friend, Dr. Christopher Wren."

During the great fire Evelyn frequently visited the ruins, and on 13th September "presented His Majesty with a survey of the ruins, and a plot for a new city, with a discourse on it; whereupon after dinner His Majesty sent for me unto the Queen's bedchamber, Her Majesty and ye Duke † only being present; they examined each particular and discoursed on them for near an hour, seeming to be extremely pleased with what I had so early thought on."

\* Charles II.

† Duke of York, afterwards James II.

But on 15th September, the *London Gazette* announced that " His Majesty, pursuing, with a gracious impatience, his pious care for the speedy restoration of his city of London, was pleased to pass, the twelfth instant, his declaration, in council to his city of London upon that subject, full of that princely tenderness and affection which he is pleased on all occasions to express for that, his beloved city.

" In the first place, upon the desires of the Lord Mayor and court of aldermen, he is pleased to prohibit the hasty building of any edifice, till such speedy care be taken for the re-edification of the city as may best secure it from the like accidents, and raise it to a greater beauty and comeliness than formerly it had ; the Lord Mayor and aldermen being required to pull down what shall, contrary to this prohibition be erected, and return the names of such refractory persons to His Majesty and his council, to be proceeded against according to their deserts.

" That no person erect any house or building, but of brick or stone, that they be encouraged to practise the good husbandry of strongly arching their cellars. . . .

" That Fleet Street, Cheapside, Cornhill, and all other eminent streets be of a breadth to prevent the mischief one side may receive from the other by fire ; that no streets, especially near the water be so narrow as to make the passages uneasy or inconvenient ; nor any allies or lanes erected, but upon necessity, for which there shall be published rules and particular orders.

" That a fair quay and wharf be left on all the river side, no houses to be erected, but at a distance declared by the rules. That none of those houses next the river be inhabited by brewers, dyers, or sugar-boilers, who, by their continual smokes, contribute much to the unhealthiness of the adjacent places ; but that such places be allotted them by the Lord Mayor and court of aldermen, as may be convenient for them, without prejudice of the neighbourhood.

" That the Lord Mayor and court of aldermen cause

an exact survey to be made of the ruins, that it may appear to whom the houses and ground did belong . . . that no man's right be sacrificed to the public convenience. After which a plot and model shall be framed of the whole building, which no doubt may so well please all persons, as to induce them willingly to conform to such rules and orders as shall be agreed to. . . .

“And to encourage the work by his example, His Majesty will use all expedition to rebuild the custom house . . . and upon all his own lands, will part with anything of his own right and benefit for the advancement of the public benefit and beauty of the city; and remit to all persons who shall erect any new buildings, according to this his gracious declaration, all duties arising from hearth money for the space of seven years.”

The preamble of the Act of Parliament for rebuilding the city of London was as follows:—

“Forasmuch as the city of London being the imperial seat of His Majesty's kingdoms and renowned for trade and commerce throughout the world, by reason of a most dreadful fire lately happening therein, was for the most part thereof burnt down and destroyed within the compass of a few days, and now lies buried in its own ruins, for the speedy restauration whereof and for the better regulation, uniformity, and gracefulness of such new buildings as shall be erected for habitations in order thereunto; and to the end that great and outrageous fires (through the blessing of Almighty God), so far forth as human providence (with submission to the Divine pleasure) can foresee, may be reasonably prevented or obviated for the time to come, both by the matter and form of such building, and, further, to the intent that all encouragement and expedition may be given unto, and all impediments and obstructions that may retard or protract the undertaking or carrying on of a work so necessary, and of so great honour and importance to His Majesty and this kingdom and to the rest of His Majesty's kingdoms and dominions, may be removed. Be it therefore enacted, etc.”



There follow various provisions more or less detailed for the rebuilding—*e.g.*, rules and directions to be observed in building, penalties, prevention of irregular buildings, buildings to be divided into four sorts according to the class of street they front, powers of the Lord Mayor, etc., to classify streets. The buildings to be of brick, stone, and oak, “and in regard to building with brick it is not only more comely and durable, but also more safe against future perils of fire.” There then come some clauses as to the duty of the surveyors and supervisors, and some betterment clauses by which the money received from those whose frontages were improved by street widenings, etc., was to be paid to those whose property had been used for the widenings.

**Wren and Evelyn.**—The best known of the suggested plans for the rebuilding of London is that by Sir Christopher Wren, who planned the area consumed outside the city walls on a radiating or concentric system around an octagonal place between Ludgate and the Temple.

The area within the walls was generally on a rectangular system, but modified considerably by diagonals and concentric streets surrounding the Exchange.

The Exchange was provided with direct access from Ludgate, Newgate, Bishopsgate, Aldgate, and London Bridge, and with good, though less direct, approaches from the other gates.

St. Paul's Cathedral was placed at the points where the road from Ludgate divided to go to the Exchange and to the Tower.

It must be remembered, however, that the population of London within the walls in 1631 was only 71,029, and the entire population including Southwark was only 130,280, according to a return made by the Lord Mayor to the Privy Council. It is, therefore, quite possible that, even if the plan prepared by Wren had been adopted, we should have found the streets in the area he planned scarcely adequate for the nucleus of a town the size of Greater London; and, in any case, the area included in



his plan was only about 500 acres or considerably less than one square mile, while the area of "Registration" London is 121 square miles, and the Greater London of the police districts is over 700 square miles.

**St. Petersburg.**—Twenty years after the fire of London, Peter the Great was staying in a house belonging to John Evelyn, the author of one of the plans for rebuilding London. Whether Peter saw Evelyn's plans is uncertain, but, doubtless, he learned something about the rebuilding of the city as well as shipbuilding work at Deptford. One thing we know is interesting, although not directly connected with town planning. Evelyn was dissatisfied with the condition in which the Czar had left his house, and he asked Wren to make out a list of dilapidations for him. On his return to Russia, Peter started building a new city, which became the new capital in 1712. St. Petersburg shows some clear indications of what is often called radial planning, although other parts of the city afford equally definite examples of rectangular planning. For instance, from the admiralty building three fine streets diverge, one central avenue to the barracks and a railway station, and the two oblique streets leading to the important stations for Moscow and Warsaw. We can hardly imagine, however, that Peter's architects foresaw the advent of the railways.

**Karlsruhe.**—Later in the century, Karlsruhe, the capital of a smaller state, was laid out in a way which may be considered the extreme development of the radial system, for there are 16 streets radiating from the grand ducal castle, and it may be presumed that, if the parks and palace grounds had not occupied half the circumference of the palace, we should have had 32 streets radiating from one point.

**Philadelphia and Washington.**—The next scene of investigation is in the New World. By the middle of the 18th century New York had adopted rectangular planning for its extensions, but had not attempted to alter the older irregular planning. Philadelphia had grown from the beginning on a definite and simple, if imperfect and

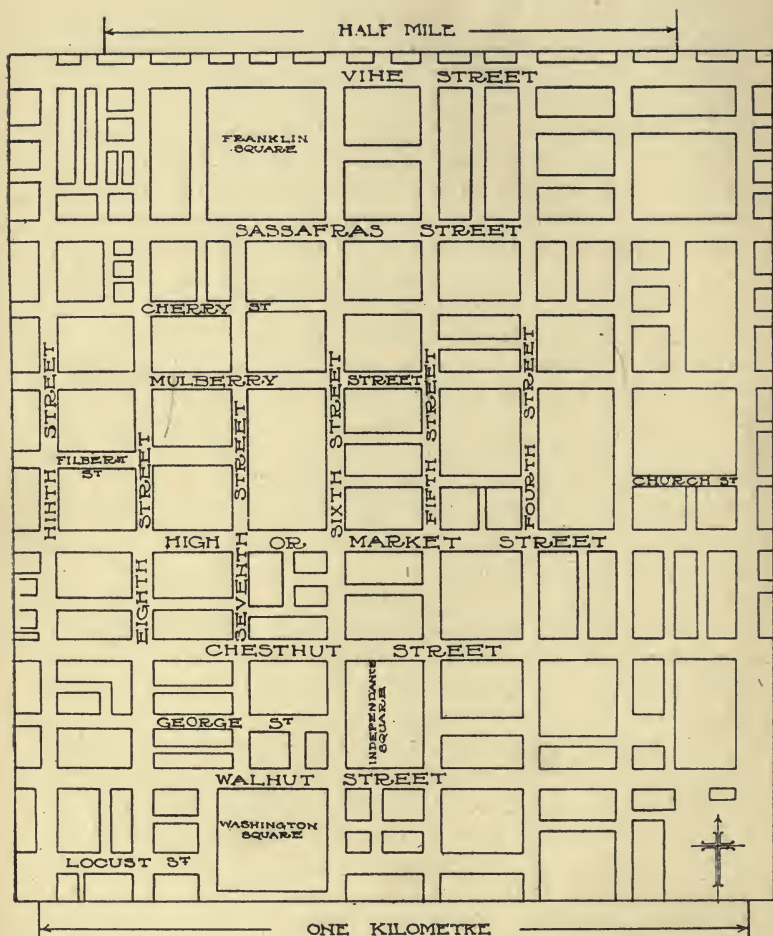


Fig. 3.—Plan of a Modern Town, Philadelphia (U.S.A.).

The planning is strictly rectangular, and the building blocks are nearly all of the same size.

The streets parallel to the river are numbered, and those at right angles are in many cases named after trees.

Three public squares are shown in the section illustrated, and there is one just outside the west border.

very monotonous, plan; but the time approached for a national capital to be established, and the capital was to be situated in a specially chosen area and laid out in a systematic manner after due deliberation. The conditions were new in some respects, for, while other capitals had been selected or founded by Kings and Emperors, this was to be the capital of a young republic. Nor was this the only new circumstance, there had been great cities built or beautified by the labour of slaves or at the expense of those who had hoarded up great riches; this capital was to be paid for by voluntary contributions at a time when the national treasury was empty.

On the 10th July, 1790, an Act of Congress was passed for "establishing the temporary and permanent seat of government of the United States." It declared:—"That a district of territory not exceeding 10 miles square, to be located, as hereafter directed, on the River Potomac at some place between the mouths of the eastern branch and Conogocheague, be, and the same is, hereby accepted for the permanent seat of the government of the United States, provided, nevertheless, that the operation of the laws of the state within such district shall not be affected by such acceptance until the time fixed for the removal of the government thereto, and until Congress shall otherwise by law direct.

"That the President of the United States be authorised to appoint, and by supplying vacancies happening from refusals to act, or other causes, to keep in appointment, as long as may be necessary, three Commissioners who, or any two of them, shall, under direction of the President, survey, and by proper metes and bounds define and limit a district of territory under the limitation above mentioned, and the district so defined, limited, and bounded shall be deemed the district accepted by this Act for the permanent seat of the government of the United States. That the said Commissioners, or any two of them, are to have power to purchase or accept such quantity of land on the eastern shore of said river, within the said district, as the President shall deem proper for the use

of the United States, and according to such plans as the President shall approve. The said Commissioners, or any two of them, shall, prior to the first Monday of December in the year 1800, provide suitable buildings for the accommodation of Congress and the President, and for the public offices of the government of the United States. That for defraying the expense of such purchases and buildings the President of the United States be authorised and requested to accept grants of land and money."

The land near Georgetown was selected, and arrangements were made that the area used for streets was not to be paid for, while the area required for public squares, or otherwise reserved for public use, was to be paid for at the moderate rate of £25 per acre.

**L'Enfant.**—Major Pierre Charles L'Enfant had done military and architectural work for Congress, and Washington asked him to plan the new city. He worked at it for some months in 1791, making use of plans of London, Paris, Amsterdam, and some Italian cities; he was urged by Mr. Jefferson, the State Secretary, to give full consideration to the simple rectangular plans of ancient Babylon and modern Pennsylvania, while his own memory went back to the formal designs of Versailles and other places which he had known during his youth in France. He prepared a plan which in its main lines was rectangular, but had a number of diagonal streets, and was amply provided with parks, gardens, and sites for monuments and public buildings.

The plan seems to have commended itself to all who saw it, but by the end of 1791 L'Enfant was at loggerheads with the Commissioners, and on 1st March, 1792, he was dismissed.

The chief reason of the dispute appears to have been that the three Commissioners wished to publish the plan, while L'Enfant considered that if the plan were made known to everybody, there was a risk of speculators buying the choicest lots, and putting up buildings which would disfigure the city.



As L'Enfant refused to hand over the plan, the Commissioners got Andrew Ellicott to prepare another in imitation of the original. The simplicity of the general scheme of L'Enfant's plan was such that Ellicott was able to make a very fair reproduction from the instructions given him by the Commissioners, who had examined L'Enfant's design.

After L'Enfant's death in 1825 his original plan became available for comparison with Ellicott's, and it is now in the Library of Congress.

**The Past One Hundred Years in England.**—After considering the planning of America's beautiful capital, probably the most successful example of town planning on an extensive scale in modern times, it is necessary to return to our own country and note our small attempts at regulating the growth of towns during the past century. Many towns have increased enormously in population, and area built on since the first systematic census was taken in 1801, and, had satisfactory town planning schemes been adopted then, there would have been in many cases very small areas of the old haphazard development left in the centres of our towns. Even in the case of an ancient town of slow growth, a glance at a map of 100 years ago often shows that the area then built on was smaller than the historical importance of the town would lead us to assume, and the century's growth is much greater than the sleepy condition of the town would suggest.

Whether a period of wholesale town planning would have been, or would now be, a good thing is a matter on which opinions may differ, but the one fact we do know is that very few towns actually were planned with a view to future growth.

**London.**—Some parts of London, where large estates were in the possession of wealthy landlords, were laid out early in the 19th century after an orderly plan; not, indeed, on the lines now advocated for the suburbs of provincial towns, but yet on a noble system, with stately squares and straight streets of fair width, fronted by



houses of dignified appearance. Probably the largest district of this kind is that surrounding Russell Square, but there are other areas within a mile or two of the city, where the houses and streets remain memorials of liberal and well thought-out planning, even if, in some cases, the class of tenant which originally occupied these houses now goes further afield.

So, too, in provincial towns there were often small areas and occasionally larger ones developed on systematic lines, but, generally, owing to the influence of great landlords rather than as the result of co-operation of small owners or any legislation on behalf of the community at large.

**Birkenhead.**—Birkenhead is, however, an example of town planning under the control of commissioners who were appointed in 1833. The population of the township was about 3,000 on an area of 1,280 acres, and 10 years later the area was extended so that the total area was 1,719 acres and the population 11,100.

The inhabitants showed considerable enterprise, for instance, they laid out 37 miles of roads with an average width of 40 feet, but with individual roads ranging from 18 to 60 feet. They also acquired 132 acres of land for a public park, and although the various expenses of development were a serious tax on the financial resources of the district and the progress of building operations was for a time checked, yet the town has reason to be satisfied with, and even proud of, the general results of its initial policy. The population of the town-planned areas is over 70,000, or rather more than half that of the entire County Borough.

One unfortunate circumstance is that areas outside the older borough were allowed to grow without proper control, and, although they have now been absorbed by the borough, the opportunity for any effective planning has gone.

**Report of 1842.**—In 1839 a Royal Commission was appointed to enquire as to the causes of disease among the labouring classes, and in the course of their

investigations the commissioners obtained some valuable information on housing and town planning.

Some pages of the *Report* seem so appropriate to the circumstances of 70 years later that they might have been reprinted as a preface to the Housing and Town Planning Act of 1909.

On page 287 of the *Report* it states :—“ The most important immediate general measure of the nature of a Building Act, subsidiary to measures for drainage, would be a measure for regulating the increments of towns, and preventing the continued reproduction in new districts of the evils which have depressed the health and the condition of whole generations in the older districts. Regulations of the *sites* of town buildings have comparatively little effect on the cost of construction, and it may in general be said that a Building Act would effect what any enlightened owner of a district would effect for himself, of laying it out with a view to the most permanent advantage, or what the separate owners would effect for themselves if they had the power of co-operation, or if each piece of work were governed by enlarged public and private views. Had Sir Christopher Wren been permitted to carry out his plan for the rebuilding of London after the great fire, there is little doubt that it would have been the most advantageous arrangement for rendering the whole space more productive, as a property, to the great mass of the separate interests, by whom the improvement was defeated. The most successful improvements effected in the Metropolis by opening new lines of street, and the greater number of the openings projected are approximations at an enormous expense to the plan which he laid down. The larger towns present instances of obstructions of the free current of air even through the principal streets, and of deteriorations, which a little foresight and the exercise of an impartial authority would have prevented. In one increasing town, a builder made a successful money speculation by purchasing such plots of ground as would enable him to erect impediments and extort compensation for their removal from

the path of improvements in building. The improvements affecting whole towns are also frequently frustrated by the active jealousies of the occupants of rival streets. It would appear to be possible to provide an impartial authority to obtain and, on consultation with the parties locally interested, to settle plans for regulating the future growth of towns, by laying down the most advantageous lines for occupation with due protection to the landowners' interest. The most serious omissions in the building of common houses are so frequently oversights as to make it probable, that if it were required that a plan of any proposed building should be deposited with a trustworthy officer, with a specification of the arrangements intended for the attainment of the essential objects, such as cleansing and ventilation, the mere preparation of the document would of itself frequently lead to the detection of grievous defects.

. . . In a work which is considered in Germany the chief authority in respect to the administrative duties comprehended under the term police, the author, Professor Mohl, of Tübingen, in speaking of the sanitary police of towns, observes that 'medical police is both in theory and practice essentially German. In German states only, as Austria and Prussia, has anything been done in it systematically; the literature also of medical police is almost entirely German. Other states either do nothing at all, as England, the United States of America, or only very imperfectly, as France; where anything is done, German principles and arrangements are closely imitated.' "

"It is stated that some of the new towns and the new parts of the old towns in Germany, as in Stuttgart, Mannheim, Darmstadt, exhibit striking marks of this care in the comparative structure and arrangements of the houses, and in the general administration, with a view to the health and pleasure of the population, which is sometimes impressively displayed in the superior condition of the public walks and gardens, as at Frankfurt-am-Main and Baden Baden. The professor's

reproach is, however, scarcely applicable to the substantive English law."

The *Report* then mentions some early English enactments dealing with general sanitary matters rather than with town planning. There is, however, in the appendix a lengthy communication from Captain James Vetch of the Royal Engineers, which, while for the most part discussing sewerage and roads, has one or two pages on town planning. He says :—

"It will be sufficiently obvious that where towns are constructed on a regular plan with straight streets, the communication, ventilation, and drainage are comparatively easy, and far more effectual than under contrary circumstances; but it unfortunately happens that our large towns contain many narrow crooked streets, with little or no arrangement, and though it may not be practicable materially to mend what we now find so bad, we cannot fail to perceive that a little timeous system and arrangement would have avoided many evils we now complain of, with a less structural expense and a much improved value of property to the owners.

"Many or most of the towns, both in British and Spanish America, are formed on regular plans, commencing with a square as a nucleus, to the faces of which the streets (as they rise) are made parallel, so that, whatever may be the extent of the town, the increments take place in regular order, until stopped by some natural obstruction; and though it may be true we cannot now enjoy the good effect of any such original precaution, yet as respects the extension or future increments of our cities and towns, much benefit may still be derived by resorting to system; and though we cannot now remodel what has been built by proceeding regularly from a central point to the circumference, yet we may adopt an external line or periphery as a basis of operation for the construction of the future extension of the town on a regular plan or system.

"It is fortunate for the Metropolis that there existed some large landowners in its vicinity, as the families of



Bedford, Grosvenor, and Portman, whose taste and spirit corresponded with their means, and that large portions of the increments of London, consequently, possess all the advantages that a well-considered system of utility could require. . . . It will not fail to be remarked that the increments of London, just alluded to, have been constructed chiefly for the abodes of the wealthy, who can generally protect themselves, and remove from any noxious neighbourhood. But the state, as natural guardian of the poor, is the more called upon to interfere with its authority to see that the streets and houses intended for the labouring classes are constructed on comfortable and sanitary principles.

“Most of our large towns have increased upon small irregular nuclei, and received their increments chiefly from buildings erected along the roads branching into the country, presenting so many main streets radiating from a centre, but leaving the intervening spaces to be irregularly and imperfectly filled up at subsequent periods as chance or necessity directed, and in this manner has arisen the great defect, to be generally observed, of a good lateral connection between the great radiating streets. . . .

“I would propose in the first instance to connect all the radiating streets of the town by straight lines drawn as near to the mass of buildings in the town as the vacant or unbuilt ground would admit of ; this operation would have the effect of inclosing the town in an irregular polygon, upon each side of which, as a normal line, I would propose to lay out the future streets, one series of which would be parallel to the normal lines, and another series would be perpendicular to them. . . . It would be valuable in most cases that the normal polygon should be formed into a series of streets of ample dimensions, fit for the reception of public buildings, . . . and would be well adapted to serve, if wide enough and planted, for alamedas or public walks.”

Captain Vetch went into a few more details as to the advantages of planning, and annexed to his



communication a plan of Birmingham with a design for the increments of that town on the principles he had suggested. He also anticipated the possibility of large landowners or groups of smaller ones preparing town-planning schemes and submitting them for the approval of the authorities.

The fact that the greater part of Captain Vetch's communication dealt with drainage and other sanitary matters may possibly have led to his town-planning proposals being overlooked, but it is a melancholy fact that 67 years elapsed before a general Town-planning Act gave Local Authorities the opportunity of doing anything on the lines so ably put forward by this gentleman, and, to some extent, recommended in the Commissioners' *Report*.

**Barrow-in-Furness.**—The longest reign in English history was not sufficient for the enactment of a general act dealing with this subject, and very few private or local acts gave the Local Authorities any town-planning powers. There is one case, however, which may be mentioned; in 1875, just before the beginning of the model bye-law period, a small town in the north of England obtained an Act of Parliament which gave it fairly extensive powers with respect to town planning. Barrow-in-Furness, a fishing village, which in 1847 had only 325 inhabitants, and by the 1871 census had increased to 18,911, was enlarged, and granted parliamentary powers wider in some details than those now given by the 1909 Act, and the town has been developed on systematic lines with wide roads and open spaces, mostly on the rectangular method, but more recently with a little more flexibility; and at the last census the population was 63,775. Few English towns have grown so rapidly, and it is fortunate that the Town Council were entrusted with such unusual powers, and have exercised them with such discretion.

**Powers of Town Councils.**—We may ask ourselves why such powers are unusual? Why English Town Councils have such little authority to regulate the planning of their own towns.

Five, six, seven centuries ago our towns obtained Royal Charters granting them extensive powers, and to-day few Town Councils have power to decide what proportion of the width of a new street shall be footpath and what proportion shall be carriageway.

In the opening pages of *Town Life in the Fifteenth Century* we read:—"The town of those earlier days in fact governed itself after the fashion of a little principality. Within the bounds which the mayor and citizens defined with perpetual insistence in their formal perambulation year after year, it carried on its isolated self-dependent life. The inhabitants defended their own territory, built and maintained their walls and towers, armed their own soldiers, trained them for service, and held reviews of their forces at appointed times. They elected their own rulers and officials in whatever way they themselves chose to adopt. . . . They drew up formal constitutions for the government of the community, and as time brought new problems and responsibilities, made and remade and revised again their ordinances with restless and fertile ingenuity. . . .

"No alien officer of any kind, save only the judges of the High Court, might cross the limits of their liberties. . . . The townsfolk themselves assessed their taxes, levied them in their own way, and paid them through their own officers."

One more quotation from the same book may conclude this section of the study of town planning, and serve as an introduction to the second part dealing with laws and bye-laws. "In spite of the vigour and independence of our modern local administration every Englishman now looks ultimately for the laws that rule his actions, and the force that protects his property, to the great central authority which has grown up outside and beyond all Local Authorities."

## CHAPTER III.

## AUTHORITIES AND BYE-LAWS.

The Local Government Board and Model Bye-laws—Building Line—Building over Sewers—Combined Drainage—Temporary Buildings—Exempted Buildings—Partially Exempt Buildings—Streets, Width, Level, etc.—Details of Buildings—Walls—Air Spaces—Ventilation—Drainage Plans and Notices—Discretionary Power.

**Local Government Board.**—The central authority, as regards town planning and the general control of public health matters, is the Local Government Board, which was established in England in 1871, and differs from the Local Government Board of Scotland and that of Ireland, established later, inasmuch as the Board is purely a council of politicians without any technical members. As, however, the Board is not in the habit of assembling and its functions are performed by a President with the aid of an army of officials, the composition of the Board itself is not of great importance.

Sir Charles Dilke, who was President in 1882, may have imagined that he would have a Board to preside over, but he was soon able to publish the discovery that the Board never had met, and apparently never was intended to meet. Mr. John Burns brought our information up to date in 1907 by his replies to questions in Parliament thus :—" I understand there has never been a meeting of the Local Government Board." " It consists of the President, the Lord-President of the Council, the five Principal Secretaries of State, the Lord Privy Seal, and the Chancellor of the Exchequer ;" while in reply to a further question as to whether he would take into consideration the expediency of at once convening a meeting of his

Board, Mr. Burns replied amid laughter, "Not if I can possibly avoid it."

**Model Bye-Laws.**—In 1877 this phantom Board promulgated a set of model Bye-laws with respect to new streets and buildings, and this for many years remained the only model. Local Authorities desirous of having new Bye-laws were generally obliged to accept the model series with little or no modification. Gradually, however, some additional Bye-laws and provisoes were admitted to the series, and when a town made out a particularly good case for a special Bye-law, or took the stand that they would rather go without any new Bye-laws than accept certain clauses of the Board's model, there was often something in the nature of a compromise. As a result of the endeavours of the Board to improve the model series, aided no doubt by the pressure of public opinion, there are now at least three models and a large number of alternatives or additional clauses to start with, and there is also more willingness on the part of the Board to consider further suggestions for the modification of the Bye-laws.

It is not the purpose of these notes to discuss the advantages or disadvantages of various systems of regulating the construction of streets and buildings, so much as to state the laws and Bye-laws as they exist. There are people who object to laws and Bye-laws altogether, there are others who wish the Bye-laws to be perfectly uniform all over the area where they happen to practice, and there are those who would like the Bye-laws to be modified day by day to suit individual buildings which they are engaged upon. Then, again, there are some who thought, and perhaps still think, that with the advent of the Town Planning Act of 1909 the reign of Bye-laws ceased or would cease in all town-planned areas, but this is hardly correct, and, even if Bye-laws as such are superseded, many restrictions contained in them will be found in the schemes for regulating the town-planned areas.

The building regulations of some of the existing garden



cities and suburbs are in many respects more stringent and more detailed than the Bye-laws of many towns, but it is necessary to remember that these building regulations represent not only the Bye-laws of the Local Authority, but also the estate restrictions or requirements imposed by the land company upon their lessees. The regulations of one garden city conclude with a clause which, however proper it may be to impose upon tenants of a company, could hardly be imposed upon the ratepayers by a Town Council:—"Every person who shall erect a new building, and shall paint the external woodwork of such building, shall paint it with not less than three coats of good oil paint of approved colour."

It is often imagined that the Building Bye-laws of a district contain a complete statement of the regulations affecting new buildings in the district. This, however, is not the case, as there are various clauses in Acts of Parliament which directly control building operations.

Some of the points not dealt with in the Bye-laws, but frequently arising in practice are with respect to—

- (1) Building line,
- (2) Building over sewers,
- (3) Combined drainage,

and less frequently in connection with staircases, exits in case of fire, platforms, etc.

**Building Line.**—In addition to the Bye-laws respecting air-space in front of buildings there are several Acts of Parliament which contain clauses regulating the building line. When any building, or its front, in any street has been taken down for rebuilding or alteration the Local Authority may prescribe the building line, but must compensate the owner for any loss or damage (1875, P.H.A., sec. 155).

A somewhat similar power is given by the Towns Improvement Clauses Act, 1847, which also gives power to an Authority to permit buildings to be brought forward on agreed terms where the line of street will be improved by so doing.



The Buildings in Streets Act, 1888, enacts "that it shall not be lawful in any urban district, without the written consent of the Urban Authority, to erect or bring forward any house or building in any street, or any part of such house or building beyond the front main wall of the house or building on either side thereof in the same street, nor to build any addition to any house or building beyond the front main wall of the house or building on either side of the same."

This Act does not provide for any compensation to an owner or payment to the Local Authority, and does not affect the ownership of the land between the house and the street, but it is perhaps more frequently called into use than any of the other enactments on the subject.

Some of the principal points cleared up by the Judicial Decisions on this Act are :—

1. A corner house is to be reckoned as in both streets, so that what is generally called the "flank wall" is to be considered as a "front main wall."

2. Suppose there are two houses and one of them comes before the line of the other, then if a third house is to be built between the two, the Authority can insist on the new house being kept back to the line of the house which is further from the road.

3. The approval of a plan as complying with the Byelaws must not be taken as a "written consent" to come forward.

4. The fact that the Magistrates have imposed a penalty on a person for building without the written "consent" of the Authority does not prevent the Authority from getting an injunction for the building to be pulled down.

**Building over Sewers.**—Section 26 of the Public Health Act, 1875, says that any person who in any urban district without written consent of the Urban Authority causes any building to be newly erected over any sewer of the Urban Authority shall forfeit to the Urban Authority the sum of £5 and £2 a day, and the Authority may pull down the building and recover the expenses from the offender.

In cases where a sewer crosses private land which is afterwards cut up for building plots it is important to remember this law. Local Authorities do not usually give the "written consent" unless the sewer is at a great depth, and the builder may be put to considerable expense in—

1. Putting up his building in a special position to avoid the sewer, or

2. Paying the Authority for diverting the sewer to avoid the building.

It may be noted that the ordinary notice of approval of a plan as complying with the Bye-laws is not the "written consent" mentioned in the Act. If at the time the plan was being examined, the surveyor noticed that the proposed building would come over a sewer, the builder or other applicant would, doubtless, be notified of this fact, but cases have occurred where the plan has been approved and the presence of the sewer has prevented the building being erected. Such an event might most easily happen when the deposited block plan is incomplete, the line of street being broken off and a length figured. Then unless an official suspected the building plot was in the neighbourhood of the sewer and checked the measurement the difficulty would probably escape notice until the building was commenced.

**Combined Drainage.**—It is sometimes suggested by a person depositing plans that there is no Bye-law to require each house to be separately drained to the public sewer, and that "combined drainage" should be permitted without any special agreement being required by the Local Authority.

Section 21 of the 1875 Public Health Act gives the right of connecting a "drain" to the public sewer, subject to proper notice and compliance with the Regulations of the Local Authority.

Section 4 of the same Act explains that the word "drain" in that Act refers to a pipe from one building or from buildings within the same curtilage.

In many instances Local Authorities have allowed the

drainage of several houses to be connected to the sewer by a single line of pipes when the owner signs an agreement that this line of pipes shall be considered a private drain; or, in other words, that the owner of the houses will keep the line of pipes in repair.

There are also cases where the Courts have decided that the pipe taking the drainage of several houses must be considered a private drain, although there has been no such agreement entered into. In other cases the decisions have been quite different, and the exact reasons which have led to the various decisions are not always easy to understand; in fact, the law is generally admitted to be in a very unsatisfactory state on this subject, and various towns have obtained private Acts of Parliament to amend the general law as far as their own districts are concerned.

Generally speaking, an owner cannot claim the right to connect drainage of more than one house by a single line of pipe, and if he wishes to do so he must come to some agreement with the Local Authority.

There is a special provision in section 23 of the 1875 Public Health Act for the drainage of two or more houses by a sewer laid by the Local Authority at the expense of the owners, but it must be observed that an owner cannot force the Authority to put this clause in operation, so that this provision does not conflict with the general statement just given.

**Temporary Buildings.**—Until the passing of an Act in 1907 there was no satisfactory provision for dealing with certain classes of buildings of a temporary nature. In the case of a building erected for an agricultural show or a public congress it would have been unreasonable to insist on the walls being constructed of brick, etc., in accordance with the Bye-laws, and consequently there was little notice taken of such buildings, no plans being approved, and only such points as exits in case of fire were considered by Local Authorities.

The 1907 Public Health Acts Amendment Act gives direct power to the Local Authority to grant approvals for a limited time to such buildings, and as proper plans

are now required, there is a possibility of the promoters of shows or the owners of other temporary buildings knowing the requirements of the Local Authority on the most important points before building is actually erected.

Turning now to the Bye-laws most affecting building owners and builders, it may be observed that most Urban and many Rural Districts have Bye-laws as to new streets and buildings, some have Bye-laws as to alterations to buildings, and some have Bye-laws as to the drainage of existing buildings.

The Bye-laws in most districts are based upon "Model Bye-laws" issued by the Local Government Board, and although there are special models for rural and semi-rural districts, the great majority of Bye-laws are founded on what may be termed the Urban Model first issued in 1877. Even so, the Bye-laws for one urban district often differ from those of a neighbouring district, so that a person about to build should first provide himself with a copy of the Bye-laws actually in force in the district which is to be the scene of his operations.

It is not safe to assume that if plans are prepared so as to comply with the Bye-laws of a town that they are sure to comply with the Bye-laws of the rural area just outside the town.

Instances can be found where two districts, one an important Borough and the other a thinly-populated Rural District have Bye-laws, both recent and both based on the Urban Model Bye-laws, but the Rural District has adopted some clauses which are more stringent than those in the Borough.

The following notes are intended to be a guide to the Bye-laws with regard to the points which are most frequently arising in actual practice. They cannot be safely used as a substitute for the actual Bye-laws of any district. They seek to put some Bye-laws in more convenient form for reference, and to answer some of the more general enquiries made by architects and builders who are preparing plans which need the approval of Local Authorities, and they also deal with points which commonly



lead to the disapproval of plans as not complying with Bye-laws.

The Bye-laws as to New Streets and Buildings are, for many districts, about 100 in number, but the same Bye-law often has different numbers in different districts, so that it is not very convenient, in a general guide like this, to refer to an individual Bye-law by the number which is prefixed to it in one particular set.

These notes as a rule follow the general arrangement of the Bye-laws, but where the same subject is referred to in different parts of the Bye-laws it has sometimes been found convenient that all the notes on that subject should be together.

The Bye-laws start with the interpretation of terms used, and, although further reference will be made to one or two of these terms, it may be here noted that the Bye-laws classify buildings as—

(1) Public Buildings,

(2) Buildings of the Warehouse Class,

both of these being defined, although not perhaps very clearly and then—

(3) Domestic Buildings are said to be not merely dwelling-houses, but any other building which does not belong to one of the first two classes.

Judicial decisions have given a very wide meaning to the term “dwelling-house,” but even then there are many buildings, not dwelling-houses, which the Bye-laws regard as domestic buildings.

**Exempted Buildings.**—The Bye-laws, then, say that certain buildings shall be entirely exempt from the Bye-laws; so that no plans need be submitted to the Local Authority.

These generally are—

1. Government buildings, some hospitals, and certain buildings of navigation companies and mines.

2. Certain buildings which are either very small or are kept at a considerable distance from streets and the boundaries of the properties.

Many towns have Bye-laws which exempt green-houses



and some similar buildings, while other towns have Bye-laws which allow small buildings, such as cycle-houses, etc., to be erected without any plans being deposited. One such Bye-law exempts any building of not more than 500 cubic feet, for instance, a building 12 feet long, 6 feet wide, and 6 feet 6 inches high, providing that it is—

- (1) Not a public building,
- (2) Not used for habitation,
- (3) Not used for habitual employment,

and that it complies with a few other requirements which are easily met.

The exemption of a larger building depends on its (1) height, (2) size, (3) distance from nearest street, (4) distance from nearest building or boundary.

The following table gives the requirements in some districts :—

Maximum Height.	Maximum Size.	Minimum Distance from	
		Street.	Building, etc.
Feet.	Cubic Feet.	Feet.	Feet.
20	50,000	8	10
30	125,000	8	30
Larger than the above,		30	60

It is important to note that it is not sufficient to keep so many feet away from the nearest building, otherwise in the case of adjoining plots the owner who built first could build over the whole width of his plot, and this building would prevent his neighbour building near it.

**Partially Exempt Building.**—Some recent sets of Bye-laws provide that certain buildings, mostly of iron and not for human habitation, shall be exempted from the Bye-laws as regards the construction of walls and some other matters. They must, however, comply with the remainder of the Bye-laws, and the plans of these buildings must be submitted for approval.

The chief particulars are shown in the following table :—

Maximum Height.	Maximum Size.	Maximum Distance from		
		Street.	Building.	Boundary.
Feet.	Cubin Feet.	Feet.	Feet.	Feet.
12	2,000	..	..	10
15	15,000	8	15	15
30	80,000	8	30	30

**Streets, Width, Level, etc.**—The next Bye-laws are as to new streets. The materials of construction are not usually specified, so that a kerb formed with floorboards on edge and a path constructed of sawdust might comply with the requirements of the Bye-laws.

Where, however, any private street in an Urban District is not made up to the satisfaction of the Local Authority, the Authority may give notice to the owners and occupiers of the adjoining premises to carry out various works to the street, and, if such works are not carried out within a prescribed time, the Local Authority may make up the street and charge the owners with the cost.

As the Local Authority have a very wide discretion in deciding what works are necessary, it is generally advisable in the original construction of the street to use such materials as are likely to satisfy the Local Authority for a considerable time, or to be of use when the street is reconstructed later on at the expense of the owners.

In some districts outline specifications have been prepared for the guidance of persons laying out new streets, and though there is no compulsion to carry out the work in accordance with such specifications, yet there is generally an advantage to be gained by doing so.

The actual requirements of the Bye-laws as to new streets are chiefly as to longitudinal gradient, transverse fall, and, more important still, as to width. In respect of width a Local Authority would sometimes be glad to have power to modify either the total width or the proportion which is to be devoted to carriageway, but it is

somewhat unfortunate that although the Local Authority has such wide discretion as to materials when the road comes to be made up, they have no discretion as to the width of carriageway or total width of street.

Back lanes and some streets under 100 feet long are usually specified to be of less width than ordinary carriage roads, but the width of new streets intended for use as carriageways is generally fixed at a minimum of 36 to 40 feet entirely open to the public.

In some districts the width is required to be more, say 48 feet from the house line to the opposite side of the street, so that if the open road consisting of carriageway and two paths is 36 feet there would be in front of the houses on each side a space of 12 feet which might be used for gardens, the total width between houses being 60 feet. If, however, an owner prefers, he can make a road 48 feet wide with the houses built close up to it.

The width of each footpath is generally fixed at one-fifth or one-sixth of the entire width of the street, so that a 24-foot carriageway is usual with two paths of 6 or 8 feet each.

In some districts there is a Bye-law which requires a back lane or secondary means of access to be provided in connection with a new street. More frequently the provision of such a back lane is optional.

The 1907 Act gives the Local Authority power to require the position, direction, termination, or level of proposed new streets to be varied within certain limits and upon payment of compensation, and the Local Authority may also require the corners of buildings at the corner of new streets to be splayed off upon payment of compensation.

**Details of Buildings.**—The next group of Bye-laws is “with respect to the structure of walls, foundations, roofs, and chimneys of new buildings, for securing stability and the prevention of fires, and for purposes of health.”

Foul sites, such as those where animal or vegetable matter may have been deposited, must not be built upon until such matter is properly removed.

In the case of new *domestic* buildings the site must be asphalted or concreted. The concreting is in most places required to be good cement concrete, rammed solid, 6 inches thick. In some districts 4 inches thickness is allowed, and in some others it is only required where the soil is damp.

The concrete can often be made to do duty as a floor for a cellar or kitchen, and, although the primary object of the concrete is rather sanitary fitness than stability of construction, there are cases where a concrete raft over a poor foundation may serve for purposes of good construction as well as of health.

**Walls.**—The Bye-laws as to walls require almost all external walls to be of brick or stone properly bonded and laid in good lime or cement mortar.

Some Bye-laws permit half-timber construction under certain circumstances, and most sets permit concrete walls and walls of other hard and incombustible substance, but when the courses are not horizontal the thickness has to be one-third more than the thickness for brick walls—in other words, a random stone wall 12 inches thick would be used instead of a 9-inch brick wall.

Hollow walls are permitted for external walls, and are often prescribed for basement walls.

The proviso as to walls projecting or overhanging for the purposes of architectural ornament does not allow plinths, pilasters, etc., to encroach on the footpaths of the street, whether public or private.

Footings must be in depth two-thirds the thickness of the wall and in width double the thickness of the wall, unless an adjoining wall interferes. The usual Bye-law does not allow the projecting footing to be omitted on account of the boundary of the adjoining property, and, therefore, it is advisable for some agreement to be made between the owners of sites where houses are intended to be built close to boundaries.

There is no hard and fast rule as to concrete foundations if the ground is solid or there is some other sufficient foundation. In some instances the foundation will be a



girder, although not specially mentioned in this part of the Bye-laws.

Damp-proof courses must be inserted in all walls of new buildings, whether the building is of the domestic class or not.

The damp course must be below the level of the lowest timbers and at least 6 inches from the adjoining ground. If the levels are such that one damp course cannot fulfil both of these conditions, as in the case of basements, for instance, then the wall must be hollow and two damp courses must be used. It is often possible by the construction of a small sunk area or the use of a vertical damp course to prevent the ground being in contact with the exterior of the wall, and so obviate the necessity of using hollow walls.

In some districts the Bye-laws specify that the damp course need only be 3 inches above the ground, and it may be pointed out that, in deciding the height of damp courses for any particular building, some regard should be paid to the character of the ground surface adjoining the wall. Where, for instance, there is garden ground it must be borne in mind that flower-beds against a wall have a tendency to get higher, and may get above the damp course, and thus render it less useful.

The Bye-laws give rules for measuring lengths and heights of walls, storeys, and buildings. They should carefully be noted, as the height is measured differently for different purposes.

The height of a building for the purposes of the party wall Bye-law (generally about the twenty-fifth) is taken from the top of the footings of the walls to the top of the parapet or to half the height of the roof, whichever is higher.

The height of a building for the air-space Bye-law (generally about the fiftieth) is measured from the level of the open space to the top of the parapet or half the height of roof.

It may be observed that the height is taken to the highest building, which is generally in front, while the



distance across the air-space is taken from the back, often a low building.

The question is sometimes asked, "Are there any Bye-laws regulating the thickness of inside walls?"

There are no Bye-laws as to partitions or inside walls, except what are called "cross-walls." The whole length of an exterior wall is measured for the purpose of determining what thickness it should be, *unless* it is divided by a cross-wall, that is, a wall—

(1) At least two-thirds the thickness prescribed for an exterior wall of the same height and length,

(2) Going up to the top of the topmost storey,

(3) Not cut away in any storey so as to have a greater area of openings and recesses than the area of solid wall that is left.

If, in any part of its height, a cross-wall becomes external, then it requires to be made as thick as if it was altogether an external wall.

The usual Bye-law as to cross-walls is not altogether satisfactory, as it is possible to place the opening or recess in a position which renders the benefit of the cross-wall very slight, and, on the other hand, there are cases where a larger opening might be permitted in another position without the stability of the building being reduced.

In the case of party walls no opening must be made, and provision must not be left for a future opening in a party wall. This ordinary Bye-law does not absolutely prevent an opening being made at some later time, but in many towns there is a further Bye-law in force which says that such an alteration must not be made.

It often happens that a person about to build a house adjoining an existing house comes to some arrangement with his neighbour for bonding into and generally making use of an existing exterior wall. This avoids the necessity of constructing a new wall, and there is no objection to this course. Occasionally it is suggested that a  $4\frac{1}{2}$ -inch wall should be built against, but independent of, the existing wall; this method does not comply with the Bye-laws.

The proper thickness of walls is the subject of many questions, and it may be well to state some of the most frequent cases in a form different from that which is used throughout the Bye-laws.

**Domestic Buildings.**—The walls may be 9 inches thick when—

- (1) The whole height is not more than 25 feet,
- (2) The length is not more than 30 feet, and
- (3) There are not more than two storeys, neither of which is more than 10 feet high.

In some districts the 9-inch wall is allowed, even if there are more than two storeys.

The wall may be 9 inches for the top storey, and must be  $13\frac{1}{2}$  inches for all below, if it is not more than 35 feet long and 40 feet high, or for any length, if the wall is only 30 feet high.

In some districts it is possible to have two storeys of 9 inches and the rest of  $13\frac{1}{2}$  inches under certain conditions.

**Public and Warehouse Buildings.**—The only case where a 9-inch wall can be used is for a top storey, not more than 10 feet high where the total height of the wall is not more than 30 feet.

A thickness of  $13\frac{1}{2}$  inches at the base suffices for a wall—

- (1) Forty feet high, if only 35 feet long ;
- (2) Thirty feet high, if only 45 feet long ; or
- (3) Twenty-five feet high, whatever the length ;

providing there is no storey more than 15 feet 9 inches high.

These few rules cover a very large number of the cases which occur in actual practice.

There are frequent enquiries as to whether, instead of a wall of uniform thickness, it is permitted to use thin walls with piers at intervals. The use of piers is only mentioned in the Bye-laws in the following cases :—

- (1) Where a storey is more than 14 or 16 times as high as the thickness prescribed for the wall.
- (2) Where the wall is more than 60 feet high and, at the same time, more than 45 feet long.

(3) Where a large opening is left, as, for instance, in a shop front.

In other cases the Bye-laws do not recognise the value of piers for strengthening a wall.

The Bye-laws as to walls of domestic buildings regulate the thickness by storeys, allowing one or more storeys of a particular thickness, but in public buildings and warehouses a different method is used, and it is not necessary for the purpose of complying with Bye-laws to make the offsets occur at floor levels.

There is, in many districts, a Bye-law requiring window frames and other woodwork to be kept back 4 inches from the face of an outside wall in a domestic building and  $1\frac{1}{2}$  inches in the case of a warehouse.

Several other Bye-laws refer to details intended as precautions against the spread of fire.

Flues must be rendered, pargetted, or must be lined with stoneware pipes, and the spandrels filled solid.

Backs of chimney openings not in external walls must be 9 inches thick for at least 6 feet above the top of the opening, if in a kitchen ; or for 1 foot, if in any other room.

Iron holdfasts, wood plugs, and timber must be kept respectively 2 inches, 6 inches, and 9 inches away from the inside of any flue or chimney opening, while timber or woodwork must be kept 15 inches away from the upper surface of hearths.

In many districts there are further Bye-laws as to construction of hearths and dealing with cases where woodwork is near the outside of flues, chimney pipes, etc.

A more common Bye-law prohibits bond timber, plates, or even plugs of wood being inserted in a party wall, but bressummers and joists may bear on a party wall, providing their ends are kept at least  $4\frac{1}{2}$  inches from the centre of the party wall.

No roof timbers, not even slating laths, are allowed to cross party walls.

The open spaces between joists and inside partition walls must be filled in with incombustible material at every floor and ceiling.

The Bye-laws in many towns do not control the construction of roofs and floors further than by requiring the roofs to be covered with incombustible material and by a few minor clauses, more for the prevention of fire than for ensuring the stability or watertightness of the building. In some districts, however, there are Bye-laws specifying the minimum strength allowable for rafters, purlins, joists, beams, etc., of various lengths, and used under various conditions.

**Air-spaces, etc.**—No air-space is required for buildings of the warehouse class, but it must be remembered that some buildings, popularly known as warehouses, do not fall within the definition given in the Bye-laws for “Buildings of the Warehouse Class.”

The general rules for new domestic buildings require—

(1) A space 24 feet across in front of the building; this space may be wholly or partially a street, and in some cases may have a porch or fence on it.

(2) A space 10 to 25 feet across in rear of the building; this must be exclusively belonging to the house, must not have even a fence upon it, but may have a water closet and an ashpit.

This space is regulated thus—

Height of Main Building.	Distance from Back Building.
Under 15 feet.	10 feet.
15 feet up to 25 feet.	15 „
25 „ „ 35 „	20 „
35 „ or over.	25 „

The rear space must be the full width of the building, so that it could rarely be less than 150 feet in area. There is, however, another clause of the same Bye-law which requires the air-space to be at least 150 square feet.

Several special clauses have been added to the general clauses already given with respect to air-space, but they



are not in force in all districts ; the following are not uncommon :—

Where an existing street is less than 24 feet wide, instead of the first person who builds a new house having to set back to 24 feet from the opposite side of the street, he is allowed to set back to 12 feet from the centre line of the street. The space between the house and the street line need not, however, be given up to the public under this Bye-law.

If the rear space tapers so that the open space at the prescribed distance is not the full width of the building, the full area of air-space must be given, but the shape may be different. The actual wording of the Bye-law appears to assume that the land tapers to a point, and a strict interpretation would necessitate more area being given when the land tapers slightly than when the land either does not taper at all, or tapers to a point. The Bye-law is intended to obviate hardship in particular cases, and does not allow a group of buildings to be erected where the sites form sectors of a circle, or where, by unusual methods, it is sought to obtain extensive frontage and small air-space.

The expression “domestic buildings” includes such buildings as stables belonging to a house, and, if the ordinary Bye-law stood alone, it would sometimes be necessary to have two air-spaces in addition to the street.

A special clause is sometimes inserted by which one air-space between the house and the stable is sufficient, if the distance is 10, 15, 20, or 25 feet, according to the height of the higher building, and no air-space is required at the back of the stable.

If the house abuts on two or more streets and there is a difficulty in providing the usual air-space, then on one side or the back there must be an open space 10 feet by 10 feet belonging exclusively to the building and connected with one of the streets by a passage or other opening for free ventilation, *and* there must be along the whole of one side or the back of the building an

air-space 10 feet wide, but this may be partly or wholly made up of a street.

An unusual provision is to the effect that the regulations as to air-space at rear shall not be enforced to prevent the re-erection of a domestic building in an old street, providing the new building is not higher or larger than the old.

The wording of the clause is perhaps capable of a somewhat wider meaning, but the actual working is as indicated above. The clause is believed to be in very few sets of Bye-laws, and is not likely to be generally allowed in new Bye-laws.

There are cases where a Bye-law has been made so as to recognise public air-spaces at the rear of houses, but generally the Bye-law requires the air-space at the rear of a house to be exclusively belonging to the house.

In some districts there is a Bye-law as to paving of yards, sometimes requiring 150 square feet at the rear of a house to be paved.

The Bye-laws do not generally recognise well holes or areas for light and air in the centre of a building. There is indeed a Bye-law as to windows, which, if strictly interpreted, would prevent the use of light wells in many cases.

**Ventilation, etc.**—After the Bye-laws as to the provision of open spaces there are a few minor but important clauses as to—

- (1) Ventilation under boarded floors,
- (2) Size and position of windows,
- (3) Ventilation of rooms without fireplaces,
- (4) A general requirement as to the ventilation of public buildings.

In some districts there is a Bye-law as to the height of rooms. Generally, it requires the height to be at least 8 feet, but in the case of a sleeping-room in the roof of a building the height must in no part be less than 5 feet, and for two-thirds of the area the room must be 9 feet high. There are some districts where the general minimum height is 9 feet, but on the other hand there are many districts with no minimum height prescribed.

The expression "habitable room," which occurs in several Bye-laws as to Ventilation, should be given a very wide meaning, and the mere fact that a room is marked on a plan Box-room or Bath-room should not be considered to take it out of the list of habitable rooms.

**Drainage.**—Where the site of a new building is damp it must be drained by field pipes, and these subsoil drains must be trapped and ventilated.

All other drains must be of glazed stoneware or other equally suitable material; they must be laid in a bed of good concrete, have proper fall and watertight joints, while if they are for conveying sewage the internal diameter must not be less than 4 inches.

The thickness of the concrete bed below the pipes is not mentioned, but the pipes must be laid *in* the bed and not simply on it. The concrete is usually brought about halfway up the outside of the pipe.

Where the drain has to pass under any building it must be laid (1) in a direct line, (2) without inlets (except sometimes from a w.c.), (3) with 6 inches of concrete all around, and (4) ventilated at each side of the building. There is also a requirement as to its depth below the ground.

The requirements as to ventilation are occasionally the subject of questions. There must be a trap and generally a fresh-air inlet between the house and the sewer, while a ventilating shaft, often the soil pipe, is at the other end of the drain.

Sometimes the ventilating shaft may be near the trap and a fresh-air inlet at the higher end of the drain, while in some cases it is convenient to have a fresh-air inlet near each end of the drain and the ventilating shaft on a high part of the building between the fresh-air inlets.

No inlet must be made to a drain inside a building, except, in some cases, the inlet from a water closet.

In the case of scullery sinks, baths, lavatories, etc., the waste pipe should discharge in the open air on a channel leading to a trapped gully.

There is a clause in the Bye-laws as to sinks for solid

or liquid filth, but this applies to certain sinks, such as are used in hospitals, and not to scullery sinks.

The Bye-law as to inlets to drains within a building prevents cellar gullies being directly connected to the drains, although another Bye-law requires that new buildings should be constructed at such levels that the lowest storey can be effectually drained. The most convenient way of meeting these requirements is to have an open channel in the cellar or to treat the waste pipe from a gully like that of a scullery sink. In either case it is necessary to arrange a small area in the open air lower than the cellar floor.

In some towns there is a separate set of Bye-laws dealing with the drainage of existing buildings, but the requirements are very similar to those with respect to the drainage of new buildings.

It must be noted that the ordinary Bye-laws as to water-closets and earth-closets refer to buildings, whether new or old.

Every person who constructs a w.c. or e.c. in a building must arrange that one of its sides shall be an external wall. And, whether actually in a building or not, there must be a window 2 feet by 1 foot or larger in a wall and opening into the external air. There must also be an air-brick or air-shaft to afford constant ventilation.

No particular pattern of w.c. apparatus is mentioned, but some of the requirements in the Bye-laws limit the choice of apparatus, and one especially prohibits the old "container" and D trap.

It may be observed here that although privies, earth-closets, and cesspools are often undesirable and really uneconomical in districts where there is a good sewerage system, yet the Bye-laws recognise and regulate such structures.

A w.c. or e.c. may be within a building, but a privy must not be within 6 feet of a dwelling-house or almost any other building. It must also be at least 40 feet from any well or stream likely to be used for drinking purposes.

A cesspool must be a considerable distance from a



dwelling-house and most other buildings, and from wells or streams. The distance is often prescribed as 50 or 60 feet, sometimes even 100 feet.

The cesspool must not have any outlet or overflow to a sewer, and such a method of construction is mentioned that, if fully complied with, the cesspool will be very expensive to construct, and will frequently require emptying. There is, therefore, an inducement to connect drainage to the sewers, if within any reasonable distance.

A Local Authority is entitled to require drainage to be connected to the public sewer, if the undrained house is within 100 feet of the sewer; but it is often advisable for the building owner to connect to the sewer, even if the distance is greater.

It sometimes happens that a Local Authority considers it is not worth while to extend a sewer at the public expense in order to drain one or two houses, but may be willing to extend it, if the owners pay part cost.

Reference may also be made to the last clause of section 23 of the 1875 Public Health Act mentioned on p. 44.

**Plans and Notices.**—The last section of the Bye-laws is of great importance to architects, builders, and others concerned in the laying out, design, and construction of streets and buildings.

The Bye-laws state what notices and drawings are required, and they should be carefully studied. They also provide for inspection by the Surveyor at any reasonable time during construction and for seven days after completion.

Written notices have to be given to the Surveyor, so that he may make special visits at important stages of the work, such as, for instance—

- (1) Before the work is commenced,
- (2) Before covering up any foundations,
- (3) Before covering up any drain,
- (4) On completion of work,
- (5) On amendment of any work which the Surveyor has found to be contrary to the Bye-laws.

The following notes cover points frequently enquired about :—

The deposited plans are generally retained by the Local Authority if they are approved, and, in some cases, if the plans are disapproved. This practice has been upheld by the courts of law, but in most districts the disapproved plans are returned to the person who deposited them. They can often be amended and re-deposited.

There is no absolute need to wait for approval before commencing the work, but should the work be found contrary to the Bye-laws it may be pulled down.

If the plans show combined drainage requiring an agreement with the Local Authority, or if the buildings will come beyond any building line, thus requiring the written consent of the Authority, it will be very unwise to start without previous sanction. In any case, some written notice must be given before commencing work, and in some districts the Bye-laws require a fortnight's notice.

Until the 1907 Public Health Acts Amendment Act came into operation the approval of a plan generally held good for an indefinite time, but now the approval will usually lapse if the work is not carried out within three years of the deposit of plans.

A new owner is not entitled to build simply because a previous owner of the same plot of ground had plans approved. The Bye-law requires that every person who intends to erect a building must give notice and deposit plans.

In some cases new sets of Bye-laws are made, which have the effect of cancelling all previous approvals which have not been acted on. In other cases the new Bye-laws do not cancel the old approvals, so that the "repeal" clause of the Bye-laws, generally placed immediately before the "sealing" clause at the end of the series, should be carefully examined.

A few words may be added as to deposited drawings. The usual Bye-law does not mention "elevations," but in order to show compliance with Bye-laws as to walls,

windows, and various other points, it is sometimes necessary to have either several sections or some elevations. The Local Authority, however, have no control over the architectural beauty or correctness of buildings, so that outline elevations, showing, for instance, the size of window openings, but not the details of the windows, are sufficient for the purposes of the Local Authority.

Where permission is asked for a new building to be brought beyond the ordinary building line and the architect thinks that the general appearance of the building might weigh with the Local Authority in exercising their discretion as to allowing the building to come forward, then, as a matter of policy, it may be worth while to deposit complete elevations.

**Discretionary Power.**—While these notes are intended chiefly to explain the Bye-laws and other laws affecting building as they actually exist rather than to dwell upon the points where they are defective or to discuss how they might be improved, yet in dealing with the subject of the discretionary power of Local Authorities it seems to be necessary to introduce a little criticism and to deal with some things that are really matters of opinion.

There are undoubtedly cases where the rigid administration of the Bye-laws causes occasional hardship; there are a few points where the Bye-laws are carelessly lax or needlessly stringent. The blame for these shortcomings is not entirely merited by the Local Authorities who have often been anxious to get Bye-laws modified to suit the special requirements of different localities.

Local Authorities have sometimes been pressed by the Local Government Board into making Bye-laws which they do not agree with. In some cases the greater wisdom has been with the Central Board, and in other cases with the Local Council, but the result remains that a Local Authority has to enforce Bye-laws which they do not like.

The Local Government Board have consistently declined to allow Bye-laws which give a dispensing power to a Local Authority, and the Judges have repeatedly stated that a Local Authority cannot dispense with Bye-laws

which it has itself made under the Public Health Acts, and cannot, therefore, effectually approve plans of a new building which would contravene its own Bye-laws. On the other hand, Judges have expressed the opinion that Bye-laws *should* contain a dispensing power.

The Local Authority and their officers are sometimes in a difficulty where no good can arise to anyone by the enforcement of a Bye-law, and where there is no strictly legal mode of exempting a particular building from the operation of a particular Bye-law.

Some minor items of non-compliance are in practice allowed to pass on the ground that *De minimis non curat lex*, the law does not concern itself about very small details. So the Surveyor perhaps ignores some point where the method of construction is not exactly what the Bye-laws prescribe.

He, however, does not feel justified in letting some other matters pass without mentioning them to his Committee. The Committee recommends some plans for approval, in spite of some deviation which they think of no importance, and so a little elasticity occurs in the administration of the Bye-laws, although the public hear nothing of it, and probably even the person whose plans are passed does not know that any special consideration has been shown towards his work.

There still remains an appeal to the Magistrates who actually have the power which has been assumed by the Local Authority, for the Magistrates can dismiss cases where they think the complaint is trivial.

Sometimes it is possible to get some slight modification made in a plan so that the Bye-laws may be technically complied with. In other cases it has been felt that it would be altogether too foolish to disapprove the plan, say, on account of insufficient air-space, where, by a slight alteration of the building, possibly making the air-space still less, the plans would comply.

Many examples might be given to show the desirability of some discretionary power being allowed to a Local Authority, although it is impossible to contend that in



those matters, such as building lines, where a Local Authority possesses discretionary power they have always used it wisely. It ought not to be necessary for a Local Authority to assume powers they do not possess, nor for individuals, either officials or architects, to adopt schemes and subterfuges in order to do something which in itself is right, but which happens to contravene a Bye-law which was intended to promote right building.

There are various words used in the Bye-laws which imply a discretionary power, such as "easy and convenient" means of communication; "properly" asphalted, bonded, constructed, etc.; "proper" footings; "good" cement, concrete, bricks, etc.; "sufficient" braces, ties, plates, substructure, piers, etc.; "effectually" to protect woodwork; "suitable" stone; so that while it is left to a Local Authority or their officers to decide, in the first instance, whether an arch or pier is sufficient, there is no latitude whatever allowed as to the thickness of a wall. In the same way the Bye-law that a new public building must be provided with "adequate" means of ventilation is considered definite enough, and is certainly elastic enough to suit any public building, yet we find much more definite and less elastic Bye-laws as to the ventilation of domestic buildings.

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## CHAPTER IV.

## POWERS OF LOCAL AUTHORITIES.

As to Streets, Parks, etc., prior to Town Planning Act—Landlords and Town Development, German Examples—The Town Planning Act, 1909—Objects and Scope of Scheme—Growth of Towns—Traffic—Classification of Town Plans.

BEFORE considering the possibilities opened out by the Housing and Town Planning Act of 1909, a few remarks may be made as to certain powers Local Authorities previously possessed with regard to making new streets, and dealing with other matters connected with the amenities of their districts. In other words, we consider the question, "What can a Local Authority do themselves in the way of estate development, apart from regulating it to some small extent by means of Bye-laws, if they do not use the new Act?"

Private Acts and Provisional Orders confirmed by Parliament frequently give power to acquire land and lay out new streets, but the ordinary powers of a Local Authority were and are very small.

By the 1875 Act an Urban Authority may purchase premises for widening or improving an existing street, or, *with the sanction of the Local Government Board*, for the purpose of making a new street.

To get a new street under these conditions requires therefore that the owner of the land, the Local Authority, and the Central Authority shall all be in agreement.

The Local Authority may also agree with any person that he or they shall make a new street on his land at his expense, and that, on completion, the road shall be taken over and maintained at the public expense; and further,

if two-thirds of the members consent, the Local Authority may agree to pay any part of the cost of making the road. This clause would help a Local Authority to get a new street without going to the Local Government Board, unless they desired to obtain a loan to cover the expenditure. The smaller or poorer Authorities, however, who cannot afford to pay for a new street out of revenue are obliged to apply to the Board for sanction.

Since 1890 an Urban Authority has had definite powers to authorise the erection of monuments and to plant trees in streets, and also has power to purchase or take on lease and maintain public walks or pleasure grounds within the district, and even to contribute to the maintenance of such walks or grounds used by the inhabitants, whether within the district or not.

When it is remembered that Local Authorities in general had such very limited powers over the development or improvement of their districts, then, instead of criticising the irregular growth of our towns, we may well wonder that any indications of comprehensive planning can be traced in them.

**Landlords and Town Development.**—Where a town was owned by one or two landlords with enlightened views there was a possibility of the development being on satisfactory lines, with something more than the minimum requirements of the Bye-laws; wider streets in the important parts, tree-planted avenues in the residential districts, parks and open spaces for general public use, and better housing conditions for the poorer inhabitants.

Where the land was divided among many owners with different ideas and sometimes with conflicting interests, such satisfactory development could not be expected. The better-disposed owners might be willing to do something more than they were obliged to do, but the unreasonableness of other owners would prevent the carrying out of any general scheme, and might even spoil the partially developed model estate of their neighbour. He in turn, it may be, lost all heart in the subject and sold his land to speculators whose object sometimes was to make large

and immediate profits, regardless of the future, and who incidentally found out the defects of the Bye-laws and the meagre powers of the Local Authority.

Some of the Continental towns which have been developed on most systematic lines have magnificent streets or buildings which commemorate the reign of some Grand Duke or other ruler who took great pride in his capital town, and did much to beautify it. The English landowner might take just as much interest in his town, laying it out with a view to general convenience rather than personal profit, providing a water supply or something equally necessary for the well-being of his tenants, but he rarely made so much display, and, instead of living in a palace fronting the main street or market square, he lived in a detached house in its own grounds, away from the townspeople, who were only allowed to range over his park on high days and holidays.

While conditions of this kind existed there was a chance of systematic planning of towns, not always on the best system, but still with some amount of deliberation and foresight. As the land got more divided, as the small landlords increased in numbers and the few large landlords became absentees, the only prospect of a town being developed on satisfactory lines lay in the Local Authority ; and here, two things were needed—the civic enthusiasm which would make the townspeople desire to do the very best they could for the town they were proud of ; and the freedom, the power to carry out schemes without having to obtain the sanction of some outside authority to every detail. These two factors appear to be requisite, quite apart from the technical skill of the town planners themselves, and this skill would have to be greater than when acting for one landowner, for here there is the further difficulty of reconciling various opinions and interests.

**German Examples.**—It would be instructive to have definite figures as to the number of landowners in different countries at various dates and to ascertain to what extent estates are being broken up. Unfortunately, the differences of methods used in obtaining such records make



comparison difficult. There is no doubt that in Germany, however, the land is held by many more persons than in England, and it is in Germany that Town Planning has been most scientifically studied and practised. On the other hand, the division of property in France is, perhaps, as general as in Germany, yet there has been little done in the way of Town Planning in France, although there have been several housing laws. One great difference between the two countries should, however, be noted as it may have some relation to the necessity for Town Planning which has been felt in Germany, namely, the increase in population, which in Germany in 1901-11 was 15·2 per cent., while in France it was only 1·6 per cent.

The prominence of Germany in Town Planning was recognised in the English Report of 1842 (quoted from on p. 34), but it happened that in that very year, a great fire took place in Hamburg, and an English engineer, Mr. W. Lindley, had a large share in the replanning of the burnt area. He afterwards held the appointment of City Engineer of Frankfurt-on-the-Main, and was called in to advise other German towns. His son, Sir W. H. Lindley, was City Engineer of Frankfurt until 1896, and with a German colleague, Mr. Beutel, was responsible for the Town Planning of Frankfurt, one of the towns most frequently referred to as an example of the laying out of modern German towns, and whose Lord Mayor, Dr. Adickes, was the author of the law which allows the municipality to group together the small plots belonging to different owners, take the land required for streets and open places, and then distribute the remainder among the owners in proportion to their former holdings.

There are many circumstances which make it inadvisable to adopt German methods of Town Planning without considerable modification, but we certainly need not be ashamed to learn from Germany in this matter. Germany, the Continental home of Town Planning, has learned much from England as regards general sanitation, and has called in English engineers to advise in connection with sewerage,

water supply, and even to help in Town Planning, while in some parts of Germany to-day there is a movement to cultivate the English cottage and small house in place of the more usual German tenement building. As to whether the great prevalence of tall block dwellings is due to mistakes in Town Planning, and particularly to the provision of wide streets expensively paved, authorities differ, but in any case we must recognise that in many Continental towns and in a few British towns there are large proportions of the population dwelling in tenements, each occupied by several families, and where the evidences of expensive Town Planning are not sufficient to account for the presence of these tenement buildings.

**Town Planning Act of 1909.**—Without here taking into consideration the question of housing or the differences of other kinds which should be noted before attempting to adopt any Continental methods to our Town Planning it seems a suitable thing to introduce the principal points of the Housing and Town Planning Act of 1909 by quotations from the Circular of the Local Government Board issued on 31st December, 1909.

“The object of the Town Planning Part of this Act is to ensure, by means of schemes which may be prepared either by Local Authorities or land owners, that, in future, land in the vicinity of towns shall be developed in such a way as to secure proper sanitary conditions, amenity, and convenience in connection with the laying out of the land itself and of any neighbouring land.

“Hitherto the conflicting interests of different owners and the absence of any power in the Local Authority to guide and control development, according to the circumstances and requirements of particular cases, has resulted to a considerable extent in the development of estates, whether large or small, with a sole regard to the immediate interests of the particular estate, and without regard to the amenity and convenience of neighbouring lands.

“Nor can the land owners be generally blamed for what has taken place. Their powers have in the past been practically limited to their own estates, and the local

circumstances connected with the interests of owners of neighbouring properties have often hindered development in the direction most in harmony with the interests of the community.

“Much has, of course, been done by provisions in public General Statutes, Bye-laws, Regulations, and Local Acts to secure sanitary conditions in the development of land. But such provisions, which commonly apply to a whole district, are inherently inelastic in their character, and are not concerned with amenity and convenience as affected by the particular circumstances of the actual land about to be developed.”

**Objects and Scope of Scheme.**—“The Town Planning Part of the new Act involves, in fact, a material advance in the relations between the owners of land and the Local Authorities in this country, and enables each party to co-operate with the other in promoting the general interest.”

The Town Planning Part of the Act consists of sections 54 to 67 inclusive and the schedules numbered 4 and 5. The first clause of section 54 states that “A Town Planning scheme may be made . . . as respects any land which is in course of development or appears likely to be used for building purposes, with the general object of securing proper sanitary conditions, amenity, and convenience in connection with the laying out and use of the land, and of any neighbouring lands.”

Instead of quoting the section in full, a bold abstract is offered here :—

The scheme may be made with respect to land—

- (1) In course of development, or
- (2) Likely to be used for building purposes.

The objects should be to secure—

- (1) Proper sanitary conditions,
- (2) Amenity,
- (3) Convenience.

The land may be situated—

- (1) Within the area of the Local Authority, or
- (2) In the neighbourhood of the area.

The scheme may be—

- (1) Made by the Local Authority themselves, or
- (2) Prepared by owners and adopted by the Local Authority.

The scheme may in some cases include areas of land—

- (1) Already built upon, or
- (2) Not likely to be built upon.

The scheme always requires the approval of the Local Government Board, and may require to be laid before Parliament.

The scheme may be revoked by the Local Government Board on application of the Authority responsible for it, or of any other interested person.

The remaining sections and the various schedules, provisions, and regulations made by the Board will require most careful consideration by the officials and experts engaged in the preparation of schemes, but there are handbooks already published dealing with the machinery for putting the Act into operation. A few important provisions of the other sections must, nevertheless, be mentioned here.

Compensation is payable in respect of property which is injuriously affected by the making of a scheme, and betterment is payable when property is increased in value by the making of a scheme, but (1) claims for compensation or betterment must be made within a limited time, (2) compensation when ascertained is payable in full, (3) betterment is shared so that the responsible Local Authority can only recover half the increase in value, (4) various matters will not be allowed to form the basis of a claim for compensation, and particularly by Section 59 (2) “Property shall not be deemed to be injuriously affected by reason of the making of any provisions inserted in a Town



Planning scheme, which, with a view to securing the amenity of the area included in the scheme or any part thereof—

- (1) Prescribe the space about buildings, or
- (2) Limit the number of buildings to be erected, or
- (3) Prescribe the height or character of buildings,

and which the Local Government Board, having regard to the nature and situation of the land affected by the provisions, consider reasonable for the purpose.”

One other section may prove of great importance, for it extends the powers of Local Authorities to acquire land by agreement or compulsorily.

A feature of the Act and the regulations which should not be lost sight of is the abundant opportunity offered for various interested parties to be consulted in connection with the preparation of a Town Planning scheme. Not only are there to be conferences with owners and persons financially interested in the lands, but persons representing architectural or archæological societies or otherwise interested in the amenity of a proposed scheme are to have opportunities of putting forward their views before a scheme is approved.

The reasons which may lead a Local Authority or an owner to propose a scheme will not always be the same. Some will look upon the Town Planning Act merely as a means towards the establishment of a garden suburb or a housing colony for the working classes, others will think more of traffic considerations and seek to arrange for roads of ample width going in the most desirable directions; again, there are those whose longing is for open spaces, parks, and recreation grounds; while others may give more attention to the beautiful, being desirous of prominent sites where fine buildings may be erected and old-world corners where trees, ancient edifices, and other existing features may be preserved. It is to be hoped that the desire to be in the fashion or to anticipate the action of neighbouring authorities will not lead to many Town Planning schemes being prepared without full

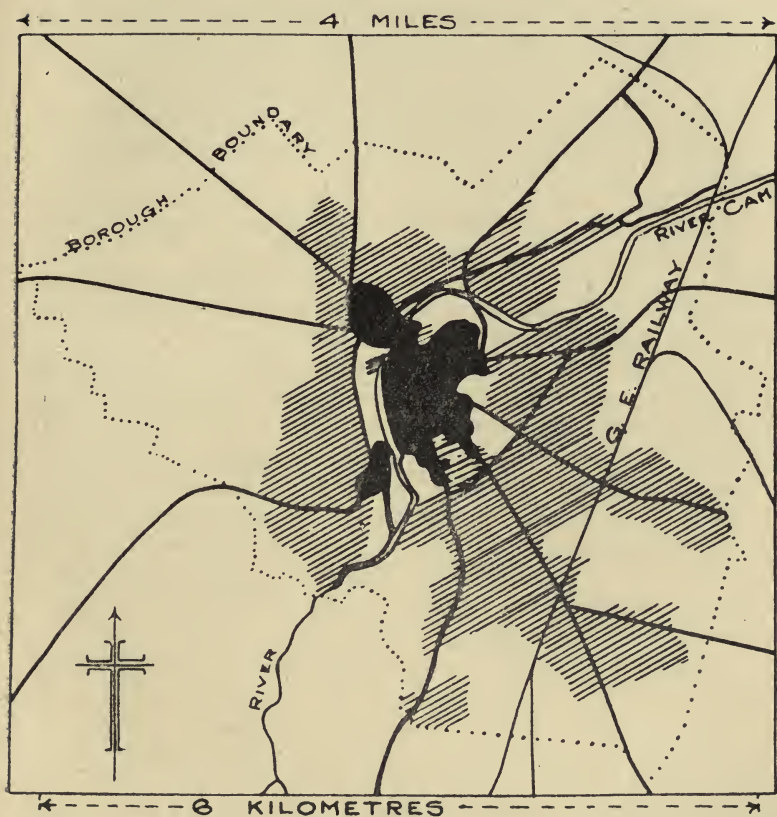


Fig. 4.—Growth of Cambridge in Past 100 Years.

This plan of Cambridge, on a smaller scale than the other town plans, shows—

- (1) The directions of the roads which converge irregularly toward the centre of the town.
- (2) The size of the town in 1800, indicated in solid black.
- (3) The additional area more or less built on at present, indicated by hatching.
- (4) The plan also shows the large areas unbuilt on.

consideration of all the circumstances. A hastily devised scheme may prove a very bad thing for a town. It is true that the powerful influence and accumulating knowledge of the Local Government Board may be used to check any particularly crude proposals, but there are points where intimate knowledge of local circumstances seems absolutely necessary before the planning of a district can receive its best solution.

**Growth of Towns.**—It is not often that the Town Planning Act will be used for the planning of a new town or the reconstruction of an old one. Usually there will be a considerable nucleus of existing built-on area, and the work of the town planners will be that of “regulating the increments of towns, and preventing the continued reproduction in new districts of the evils which have depressed the health and the condition of whole generations in the older districts,” as stated in the 1842 Report (see p. 34). It may be noted that this report of seventy years ago actually went so far as to refer to the “health and *pleasure* of the population,” and now in the 1909 Act we find “the general object of securing proper sanitary conditions, *amenity*, and convenience,” so that we may anticipate that in time something more refined than the stability of buildings, protection from fire, and even purposes of health, may come within the purview of Local Authorities.

The planning of a town and the planning of a house are often compared, and the argument is rightly put forward that, if it is desirable to prepare a plan before building a house, it is even more important to prepare a plan for a town.

Sometimes the further suggestion is made that it is the architect's business to prepare plans for houses, and, therefore, he should prepare plans for towns, but this is a point which may well be left for discussion elsewhere. Incidentally it may be mentioned that the great majority of houses are built from plans prepared by builders' clerks, and when an enterprising builder gets an independent architect to prepare a special plan, “our own exclu-

sive design " sometimes gets duplicated and repeated on sites and in circumstances where the good taste of the architect would hardly have placed it.

The greatest distinction between the ideas of planning a house and planning a town is probably the element of growth. The architect may, in his house plan, provide for possible enlargements, but it is unusual to design a three-roomed cottage which can be enlarged, if necessary, into a twenty-roomed house. If the owner required it and the site allowed it, there is no doubt that the order would be to pull down the cottage and erect a new building. But in the case of a town the possibilities of growth are very great. In the olden time when towns were enclosed by walls, the problem of laying out a town was simpler as regards plan, although in some other respects more difficult. In the case of Babylon the area enclosed was something like 185 square miles, while in the case of a Roman town, such as Chester or Colchester, Worcester or Winchester, the area was about one-sixth of a square mile, but in each case the area was defined at an early stage, and the streets, public buildings, and open spaces could be planned to suit a town of the given area.

We may compare the walled towns to the endogens, the trees, such as bamboo or palm, which rapidly grow an outside crust and then fill up the inside, while the unwalled town is like the exogens, which, adding ring to ring, growing outward and increasing in area year by year, sometimes attain enormous size. Even here the simile fails, for we have learned something as to the probable maximum growth of a particular kind of tree in various climates and circumstances, but the growth of a town is more erratic. A few figures as to the population of towns at different dates may be useful to illustrate this point.

Rome at its greatest development had a population variously estimated at from  $1\frac{1}{2}$  to 3 millions, then during the time the Popes were in exile at Avignon the population of Rome is believed to have dwindled to 30,000. Gradually the city recovered its importance, and when it became



the Capital of Italy in 1870 the population was nearly a quarter of a million, and at present it is half a million.

The population of English towns is of more immediate interest, and we may contrast the list of largest towns in 1377 (when owing to a poll tax having been levied we have some fairly satisfactory figures of population) and the list of largest towns at the present day :—

Town.	Estimated Population, 1377.	Census Population, 1911.
London, . . .	35,200	{ County area, 4,522,961 Police area, 7,252,963
York, . . .	11,400	82,297
Bristol, . . .	9,200	357,059
Plymouth, . . .	7,300	112,042
Coventry, . . .	7,100	106,377
Norwich, . . .	6,300	121,493
Lincoln, . . .	5,500	57,294
Lynn, . . .	5,200	20,205

The comparison of populations of towns at such very different dates is not altogether satisfactory, owing to alterations in boundaries and the blending of adjoining towns into one. The following is a list of the largest English towns in 1911, and it will be noticed that Bristol is the only provincial town which was in the 1377 list :—

	Census of 1911.		Census of 1911.
Birmingham, . . .	840,372	Leeds, . . .	445,550
Liverpool, . . .	746,566	Bristol, . . .	357,059
Manchester, . . .	714,427	Bradford, . . .	288,505
Sheffield, . . .	454,632	Hull, . . .	287,024

In Scotland, by far the largest town is Glasgow with 783,410 persons, so that it can hardly be described now in the words which Defoe applied to it, “ the beautifullest little city I have seen in Britain.”

Belfast, the largest city in Ireland, has a population of 385,492, but in 1798 it had only about 13,000, and even

in 1861 the population was only 121,602, which was less than half the population of Dublin at the same time.

If, instead of considering the largest towns, we compare some smaller ones and take a period of the last 50 years we find similar examples of variation in growth.

There were in 1861 eight English towns with populations between 8,000 and 9,000, but their present populations vary from 9,000 to 52,000.

Carnarvon, . . .	9,119	Guildford, . . .	23,823
Stamford, . . .	9,646	Margate, . . .	27,086
Chichester, . . .	12,594	Folkstone, . . .	33,495
Chelmsford, . . .	18,008	Eastbourne, . . .	52,544

A group of six towns with populations between 37,000 and 38,000 in 1861 shows populations varying from 58,000 to 169,000. While if we search for still larger towns with approximately equal populations in 1861 we find Norwich had 74,891, but now (1911) has 121,493, and Nottingham had 74,693, but now (1911) has 259,942.

It would be easy to find other examples of the growth of towns, and, indeed, the figures for Winchelsea and Barrow have already been referred to, but we can also picture to ourselves towns where the population has grown less, and in some of these towns there is a charm, which is totally absent from the cities which we see in the making.

One other group of statistics may be mentioned. We may take the percentage of increase in 10 years, 1901-11, and while the average increase in the hundred largest English towns was 8 per cent. there are seven towns with increases of over 40 per cent., three of them being over 80 per cent. We may think that these must be mushroom towns which have just started their history, but on examining the list we find that it includes Coventry, one of the towns in our 1377 list, and where the increase in population between 1901 and 1911 amounted to 52 per cent. showing that even an old historic city may break out into exuberant growth.

John Evelyn's diary has already afforded us some information about London at the time of the Great Fire. A little later in 1684 we find him deploring the cutting up of estates for building purposes, and saying "to such a mad intemperance was the age come of building about a city, by far too disproportionable already to the nation ; I having in my time seen it almost as large again as it was within my memory." What would he say to the present size of London ?

**Traffic.**—If the maximum eventual growth of a town could be ascertained at an early stage in its history the task of the town planners would be somewhat easier, but even then it must be observed that the greatest amount of street traffic is not always in the largest towns. The following figures have been given\* as the number of vehicles passing certain points in 12 hours, and although fuller information as to the season of year, number of days of observation, etc., would be desirable, the figures seem to indicate that Paris has an easy superiority in the amount of traffic :—

Rue de Rivoli, Paris, . . . .	33,232 Vehicles.
Strand, London, . . . .	16,208 „
Potsdam Platz, Berlin, . . . .	14,221 „
Fifth Avenue, New York, . . . .	8,665 „

While Paris, London, and Berlin have other roads with traffic approaching the figures just given, it appears that the Broadway is a very poor second to Fifth Avenue, the traffic being only 3,277 vehicles in the 12 hours.

It may be well to supplement these figures of traffic in great cities by those for one of the streets of Cambridge, a town which would hardly be suspected of serious competition with New York in such records, although the casual observer must be impressed by the cycle traffic in the university town.

In April, 1913, a census of traffic was taken in several of the Cambridge streets from 6 a.m. to 6 p.m., and the

\* *Western Morning News*, 17th February, 1913.

following figures were obtained for Hills Road, at a point near Harvey Road :—

Description.	Thursday, 24th.	Friday, 25th.	Saturday, 26th.
Motor Vehicles, . .	735	655	808
Horse-drawn Vehicles, .	1,378	1,474	1,549
Total, .	2,113	2,129	2,357
Ordinary Cycles, . .	3,802	3,663	3,201
Handcarts and-other traffic,	223	250	212
Total, .	6,138	6,042	5,770

By a curious coincidence a municipal engineering newspaper\* during this very month referred to Cambridge traffic in the following terms:—"We hear that the one-horse tramcars which perambulate the city are maintained so as just to correspond with the lethargic atmosphere which everywhere prevails in this interesting university town." Early in 1914 the trams ceased to run, but the rails remain to show that Cambridge once had a tramway system.

Little need be said about the shape of towns; when a town has some definite shape not determined by the circumstances of the site—a river, the sea, a hill, and so forth—military considerations have usually had some influence. The removal of old fortifications has often given the opportunity for fine polygonal roads or boulevards to be constructed. There are, however, a few towns with circular outlines. Louvain may be described as a circular town having in the centre a fine town hall from which three main roads radiate, cutting the area into three approximately equal parts. Middleburg, in Holland, has a circular central portion with one main street forming its diameter.

\* *The Sanitary Record and Municipal Engineering.*



**Classification of Town Plans.**—Neither does it seem necessary to say much about classification of town plans. We find it useful sometimes to speak of Formal and Informal plans ; Rectangular systems are contrasted with Radial or Concentric systems, Straight lines are compared with Curves ; Parallels and Diagonals are mentioned, and it would be possible no doubt to elaborate a scheme of classification for town plans, and imagine a particular plan as belonging to the Formal class, parallel order, rectangular genus, equidistant species, but it would be more commonly recognised by its description as a gridiron, chessboard, or block system.

Even the simplest classification will fail in actual practice, unless the plan itself is to fail through being limited to those simple forms which can be described in a few words. There will probably be points in the most informal plan where an opportunity for axial planning will present itself. On the other hand, very considerable deviations from parallel straight lines, curves of equal radius, and true rectangles, may be made in a formal plan without the eye detecting the deflection in the actual setting out.

A German lecturer on Town Planning recently described certain diseases which had afflicted German Town Planning in something like the following terms :—First there was the “diagonal disease,” then the “block or rectangular disease,” subsequently the “worm disease,” and afterwards the “open space disease.” It was a humorous way of pointing a moral. It must be confessed that there are advantages in laying out a town on the block system, for the rectangle is a convenient shape for buildings ; there are advantages in having some diagonal roads to allow traffic to get from one point to another without so frequently having to travel along two sides of a rectangle ; then a curved road, especially where the formation of the ground suggests it or some other circumstance exists to explain it, is very acceptable, and there are few towns where we have an undue proportion of open spaces, whether parks or squares.

But, on the other hand, a block system in its crudest form means that there is a monotonous set of rectangles of equal size, that there is nothing to govern the choice of sites for large or important buildings—all have to limit themselves to the standard size of a block.

If the block system is modified by the introduction of diagonals, some of the sites get spoiled, while a few may be improved. Much will depend on the lines chosen for the diagonals, and, if the distance between the parallel streets is varied, some squares or open spaces provided in the different districts, and the streets themselves not made all of uniform width, it is possible that a fairly satisfactory scheme may be reached. In fact, the plan will differ from the more rigid block system in much the same way that the plan of Washington differs from the plan of New York.

While in Europe the growth of towns has been influenced largely by artificial boundaries or the contours of the ground without regard to any straight line or other systematic planning, we find in America that the straight line and rectangular planning have often been carried on without regard to the levels of the ground, until at last the inconvenience of the gradients becomes so intolerable that as great expense is incurred there in altering the levels as we incur here in attempts to straighten or widen important traffic streets.

In a review of American engineering progress during 1912 it is stated\* that “one of the features of street work has been the reduction of gradients in a few large cities having very hilly ground. Such ground is very unfavourable to commercial development. This was undertaken first at Seattle, where entire hill tops were removed by hydraulic excavation and by steam excavators, thus changing the topography of the city’s business district. At Portland in Oregon and at Pittsburg in Pennsylvania, similar work has been undertaken. At Pittsburg the streets of a sharp peak in the centre of the city are being lowered by cutting 15 to 20 feet deep. Many of the smaller and older buildings

\* *The Engineer*, 7th February, 1913.

are being torn down, but tall office buildings are having the basements transformed into ground floors or new lower floors built beneath the existing structures, which is a somewhat remarkable feat in architectural engineering."

"Another unusual class of work is the driving of street tunnels through ridges which divide or bound a city district. At Los Angeles a tunnel of this kind is now being doubled. . . . At San Francisco a ridge is to be pierced to open up new suburban residence territory."

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## CHAPTER V.

PRACTICAL CONSIDERATIONS IN THE  
PREPARATION OF TOWN PLANS.

Direction, Width, Character of Streets—Curves and Gradients—Junctions and Gyratory System—Tree Planting and Parks—Housing and Limitation of Building on Given Area—Limitation by Bye-laws—German Zone System—Letchworth System—Relaxation of Bye-laws—Some Economical Features—German Administrative Methods.

**Direction, Width, Character of Streets.**—Nearly 20 years ago the present writer prepared a paper on “Urban Roads and their Contents.” It discussed, not those works above ground, such as monuments and trees, lamp posts and kiosks, which the last word of the title might suggest in these days of Town Planning, but it was concerned with sewers and mains for gas, water, steam, and electric power below ground and tramways nearer the surface; the first paragraph, however, touched on the question of the planning of streets:—“It is not often that the engineer has much choice as to the direction of new streets in Urban Districts, but one remark on that subject may be made. If the surface of the ground is irregular, it may be worthy of consideration whether a curved road may not be more desirable than one straight on plan; for a road which follows approximately the contour of the ground will require less excavation and filling up, both for itself and for the houses built alongside. For æsthetic reasons it may also be preferable.”

Now, however, when Local Authorities will at all events have some choice as to the direction of new streets, it is desirable to note some of the considerations which should influence that choice.



First of all we may glance at the reasons for having streets, and discuss a few of the points with regard to their width and character.

There are the traffic considerations, a road should be planned and constructed in every way to suit the traffic. It should not be regarded so much as a strip of land affording air-space to houses, although that may be an incidental use of it.

The traffic to be taken into account is not only that in regular movement ; it may be necessary to have an unusual amount of room that those who wish to look into shop windows may do so without obstructing the other people who hurry along on business ; a road generally has to find accommodation for various underground mains and works, and, lastly, there are places where a wide road may perform a most useful function as a park-way or promenade for recreation purposes with shrubberies and trees and seats and fountains. Such a road becomes to some extent a park within easy reach of the homes of many people who are unable or unwilling to walk through a mile or so of dull uninteresting street in order to spend half an hour in a public park.

We now consider various motives for the directions of streets.

The most important matter is again the traffic. If we have merely to get from one point to another, the shortest line is a straight line, and if we can fix approximately the points between which the greater part of the traffic would wish to travel we have a provisional line for our main road. The traffic will probably flow toward Railway Stations, Bridges, Markets, Town Halls, Factories, Docks, Churches, Parks, and various other centres, some of them already located, and others to be provided for in the Town Planning scheme. But a straight line will often have to be departed from when everything is considered. We may recall the story of the Czar who wanted a railway between Moscow and St. Petersburg. His engineers presented a scheme for a line which, in going from one capital to the other, joined up various intermediate towns.

not lying quite in a straight line, and the railway here and there was curved to avoid some deep cutting or tunnelling. The Emperor cared for none of these things; he placed his sword on the plan and drew a straight line between Moscow and St. Petersburg. That was to be the line of railway, and, although he afterwards gave way slightly, the line is actually not very far from straight. In our Town Planning we shall not always have such autocratic directors, but shall often have to take into consideration the contours of the ground and the boundaries of properties and subsidiary centres. We shall sometimes deflect our roads in order to obtain some distant view or to avoid some group of trees or an ancient monument, or even in order to relieve the monotony of a long straight line of common-place houses. We may, indeed, have to study convenience of sewerage and drainage, while Vitruvius has warned us against making our streets parallel to the direction of the prevailing winds. It is not only the speculative builder who will have to take into account the number of houses which should be erected facing a certain street, and, finally, we must not forget that the direction of streets may have much to do with the amount of sunlight which reaches the houses in the winter months.

**Curves and Gradients.**—A few remarks must be added with regard to the curving of street lines for other than purely utilitarian reasons. Where imposing buildings of classic design occupy a street, and even where the buildings are of less importance, but of uniform or at least harmonious design, the straight line is usually the best, but where buildings of varied sizes and characters front the street it is found that slight, and often irregular, curves add greatly to the good appearance of the street.

It is necessary to remind ourselves continually that a town plan will be judged according to its appearance on the ground and not by its lines on paper. In a formal plan the main streets may be far from parallel without the divergence being detected, the angles may be far from equal without the want of balance being apparent, and

all sorts of irregularities may mar the symmetry of the draughtsman's work to the improvement of the actual town. On the other hand, we sometimes find in an important road a change of direction where the reason for it is not at all apparent on the ground, and it is not much satisfaction to be told that this change was made so as to correspond with another road where some natural obstacle necessitated the deviation.

While we may discuss the advantages and disadvantages of straight and curved, regular and irregular streets, we do well to remember that each kind has its appropriate use. In residential districts we may welcome curves and various simple features which tend to give a distinctive character to each road, but when hurrying to the railway station we do not particularly wish to admire artistic curves and changing vistas ; most of us would be satisfied with a straight road giving an unobstructed view of a decent station building.

A very long straight street wearies the eye, unless the unpleasant sensation is relieved by changes of some sort, as, for instance, the occasional variation of the height of the buildings, the setting back of frontages, the formation of squares. In some long straight streets undulations and variations in the ground levels or the planting of trees may give a measure of relief through light and shade effects, but, generally speaking, something of unusual interest must be provided before we have a complete set-off against the monotony of the straight line.

The variation from the straight need not be very pronounced, quite a slight curve or deflection will often suffice to close in the view without injuriously affecting the traffic. A deviation of 6 per cent. from a straight line will usually increase the length of a road by about 1 per cent. The amount of curvature which is permissible depends partly on the width of the road and the ordinary speed of traffic. We cannot fix an ideal curvature for all widths and speeds, because the same curvature which would fail to produce a sufficient closing-in effect in a wide road might shut out the necessary view of traffic

in a narrow road. There is no difficulty in calculating the radius of curves to meet given conditions, but the most agreeable method is to drive along existing streets and roads, note where the limitation of field is the happy mean between the ideals of the architect and the motorist, and then get the width and radius of each curve from the map.

A 40-foot road with a curvature of half a mile radius would allow drivers to see one another when 300 yards apart. This would be quite safe for ordinary traffic, and yet the curvature would be sufficient to keep the field of view within limits which would prevent the eye being oppressed by the length of road.

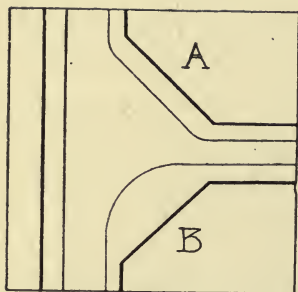
Sometimes a slight angle in the line of road or a widening to allow a small tree-planted space in the centre will sufficiently break up the length of a road, and often the formation of a small *place* of perhaps octagonal shape at a junction will relieve the monotonous length of the street, will assist in the circulation of traffic, and offer opportunities for special treatment of the corner buildings.

**Gradients.**—Attention should also be given to the longitudinal gradients of roads. It is not only necessary to limit the slope in order that a greater variety of material for the road surface may be possible, but beyond this there is the question of appearance. One of the worst cases that occurs is when the longitudinal section shows a convex curve, and a prominent building is a little way from the apex, which consequently hides the lowest part of the building.

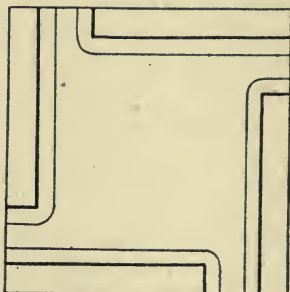
While in hilly districts the carriageways will sometimes have to wind up the hills at an easy gradient, we must not forget the possibilities of steeper paths and steps joining one road to another. Some most pleasing examples may be seen in Devonshire, for instance, at Newton Abbot, Torquay, Dartmouth in the south, and Clovelly in the north.

**Junctions.**—The rounding-off of dangerous corners of streets, particularly in the centres of towns, is a matter sometimes undertaken without due consideration, and

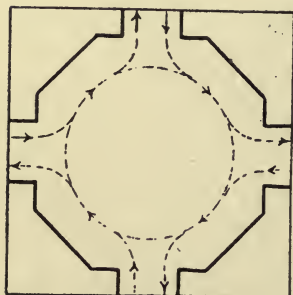




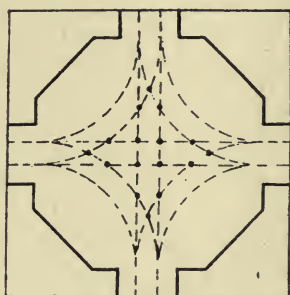
(1)



(2)



(3)



(4)

Fig. 5.—Junctions and Gyratory System of Traffic.

(1) Two methods of dealing with the kerb where the buildings are splayed at a corner.

(2) Bras de turbine form of square, very suitable for places with a small amount of through traffic.

(3) Gyratory system of traffic regulation.

(4) Collision points with ordinary system of traffic.

therefore in planning our suburbs great care should be given to junctions. It is a very frequent thing to find buildings splayed or rounded-off at a corner and the footpath carried around with uniform width as at A, when it would be better to widen the footpath at the corner, as shown at B. There are even places where it is desirable to let the footpath project so as to shorten the distance for pedestrians to cross the road, but these are exceptional. The *bras de turbine* arrangement of streets shown in (2) is not very convenient for through traffic, but is a common feature of Continental town squares.

**Gyratory System of Traffic.**—A word must be said with reference to the gyratory system of traffic, although this is more suitable for very important junctions in the centre of towns. The diagram will explain the general idea, and it will be seen that traffic always keeps to its own side, blends in the general stream for a shorter or longer part of the circle, and then leaves it without ever crossing another line of traffic. The ordinary system is shown in diagram (4), and it will be noticed that the lines of traffic cross at 16 points. The theoretical number of "collision points," as they are called, increases rapidly with the number of roads: a three-way junction has only three collision points, but it must be remembered that two three-way junctions coming close together are sometimes more dangerous than a four-way junction with its 16 collision points.

**Tree Planting.**—There is little doubt that in many town-planned areas there will be a larger proportion of tree-planted streets than is to be found in most districts at present. As mentioned on p. 66, it was only in 1890 that Local Authorities received power to plant or maintain trees in streets, although many towns had assumed such power. The question of trees is of far less importance than the selection of street lines, yet some regard should be paid to the possibilities of tree planting when the direction of roads is being laid down and the position of trees should be considered with reference to the widths of roads.

Hitherto most towns have been content with very few kinds of trees in streets, sometimes adopting such a simple scheme as to plant limes in light soil and planes in heavy soils, but there are many other trees quite suitable for street planting, and it is to be regretted that the fear of the ravages of small boys seems to prevent the use of some more beautiful trees, including fruit trees. The soil, the question of exposed or sheltered position, smoke or sea air, the rate of growth, and the amount of attention required are all matters which demand consideration, but from a Town-Planning point of view, it is the position of the trees which is most important.

It is not in many circumstances that trees do any positive good to the roads themselves, and sometimes they do much harm by keeping the road damp, their roots may give trouble in connection with service pipes and mains, while their leaves may litter the surface and block the gullies ; but, in spite of these disadvantages, we are glad to have the shade and the beauty of the trees, unless they are too close to our own windows.

The spacing of trees in various districts differs greatly, and even in the same town we sometimes find one street planted with trees 7 or 8 yards apart, and another with the same kind of trees spaced 20 or 25 yards apart. The greater distance is better as the trees can then develop properly, but the smaller distance is often chosen because, for the first 20 years or so, the small trees at long intervals do not form a sufficient furnishing for the street.

It has sometimes been suggested that trees should not be planted on footpaths less than 15 or 16 feet wide, but such a rule would prevent many streets being planted. There is, however, a way of avoiding the inconveniences of trees on narrow paths without having the total width of road increased unduly, for sometimes a row of trees on one side only of the road is very advantageous. Suppose a road runs east and west, then it may be found very convenient to have a wide gravel path on the north side with a row of trees, while the south path, being narrower, is paved with more substantial material, and has no trees.

Trees on the south side would be likely to intercept too much light from the houses, while the shade of the trees on the north path would be grateful.

**Parks.**—Turning now from tree-planted roads to parks we may say that, generally speaking, we have in English towns a larger area of parks and recreation grounds than is found in Continental towns. They are not always laid out so satisfactorily ; our gardens, like our cottages, sometimes provoke the admiration of our foreign friends ; our larger parks, like our towns, are less admirable. But, although we have in many towns extensive public grounds, we have not the many squares or *places* which form such a feature abroad.

The three largest parks in Europe are probably the Præter at Vienna, 2,300 acres ; the Bois de Boulogne at Paris, 2,100 acres ; and the Phoenix Park at Dublin, 1,753 acres ; this last is far larger than any of the London parks, but the Irish grievance in this respect is that the Phoenix Park has not as much *per acre* spent upon its upkeep as is spent on each acre of some of the London parks.

Londoners have, within easy reach by train or tram, something like 20,000 acres of parks and open spaces, including Richmond Park and Epping Forest. The City Corporation maintains 6,500 acres, the Royal Parks are nearly 6,000 acres, and the area of parks under the control of the London County Council is 5,100 acres. The open spaces belonging to the London County Council vary from less than 1 to over 800 acres, and are just over 100 in number. Being scattered about the district, one or more is within easy walking distance of most parts of London. This is a point which seems of great importance in a country where the weather is so changeable, and in considering the needs of new suburbs, the provision of small parks within easy reach of the people should not be forgotten.

**Housing and Limitation of Buildings.**—It is sometimes suggested as a standard for garden cities and suburbs that 1 acre in 10 should be devoted to parks and public spaces. It would be somewhat misleading to take the areas of



existing towns within their municipal boundaries and compare them with the areas of parks ; for, in a town which was very closely built, it might be reasonably suggested that more than one-tenth ought to be park, while in a town which has grown up on more open lines or which has large areas undeveloped, we ought not to expect one-tenth to be laid out in parks.

For many purposes of comparison it would be very useful to have a record of the area more or less built on ; in other words, to have the area which would be enclosed by a boundary drawn close to the houses, and not simply to take the area of the parish, or district, or town as is recorded for government purposes. One of the largest parishes in England is Lydford with 50,841 acres, but it would be useless to take this area when considering the real density of population, for of the 3,000 inhabitants of the parish about 1,000 are convicts in the Princetown Prison, and the whole population is chiefly concentrated on two small areas. Another example may be found in Sheffield with an area of 23,662 acres, but nearly all the population is on one-third of this area.

In the case of Cambridge the total area of the Borough is 5,457 acres, but practically the whole of the population is upon an area of 2,600 acres. There are a few isolated houses or very small detached groups outside this smaller area, and, on the other hand, the 2,600 acres include some large commons, parks, and open spaces surrounded by houses. The area of public commons, recreation grounds, and lands over which the public have rights is 332 acres or about one-eighth of the present developed area. There are, in addition, something like 300 acres of College or University grounds, which may be regarded as permanent open spaces although not belonging to the Municipality.

The statistics showing the areas of developed land are not available for towns in general, so that the best form of standard appears to be that which compares acres of parks, etc., with the population.

Starting with the Garden City suggestion of 1 acre in 10 for public space other than streets, and supposing 10

houses to the acre and a population of  $5\frac{1}{2}$  per house we get practically a standard of 1 acre of park to 500 population. When we compare this with existing towns it does not appear to be an unreasonable basis. Some towns are much better provided with public open spaces, while others are much worse. Cambridge, according to the above figures, has 1 acre to about 200 population; York is better off, having 1 acre to 90 people, while Cheltenham, sometimes called the Garden Town, has 1 acre to 500, or little better than Manchester, which has 1 acre to 560 persons; on the other hand, in Sheffield, Birmingham, and Hull there are over 1,000 persons to an acre of park.

The question of upkeep will have to be taken into account as seriously in the case of parks and recreation grounds as in the case of roads. A large park will probably cost for fencing, laying out, and upkeep less than the same area in three or four smaller grounds; on the other hand, the small parks can be distributed over the whole area, and so be within easier reach of the inhabitants. Then, if the park has a fairly good frontage to an important street, it is a pleasure to many who pass by, it is more under supervision of the police and public, and for such reasons it may be worth while to sacrifice a little building frontage rather than hem the park in by buildings, leaving merely a narrow entrance.

Although Town Planning and Housing are distinct subjects, neither can be investigated in anything like a satisfactory manner without some regard to the other. It is sometimes suggested that German Town Planning cannot afford us much instruction, because of the great difference of attitude with respect to housing. We are told that German Town Planning has either been based upon or has led to a system of housing in large blocks of tenement buildings which are quite exceptional in English towns. There is some truth in this, and we need to use much care in examining statistics as well as in forming opinions based on short visits to various towns. We need to distinguish between the conditions of urban and rural housing and

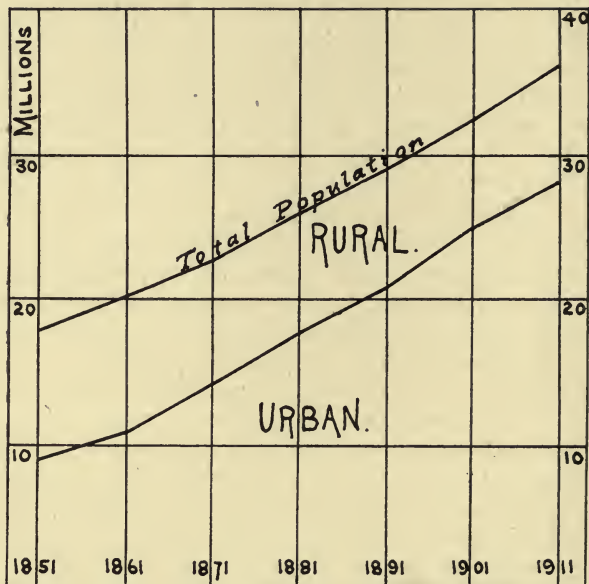


Fig. 6.—Chart of Population (England and Wales), Urban and Rural.

The diagram shows that in 1851 about half the population lived under rural conditions, but the actual number in rural districts has slightly decreased and the number in urban districts has increased threefold, so that in 1911 less than one-quarter of the population lived under rural conditions.

to consider the proportion of urban and rural population in various countries.

If we take the average number of persons per house for a whole country, we find the figures range from about nine in Germany and Russia to half that number in France, all the other European countries having intermediate values, that for England being between five and six.

If, however, we consider great towns we find the figures vary much more. In Berlin the average population per house is reported to be 53; in Vienna, 42; in Paris, 27; while London has averaged between seven and eight for many years.

When we remember that in France and Germany the urban population is only about one-quarter of the total population, we see that the houses in towns might be very large without seriously raising the average population per house when the whole country is considered.

Actually the large tenement house is common in many German towns, a few French and Belgian towns, and a very few English and Scotch towns.

Having formed some idea of the ordinary size of house we are in a position to consider what should be done to prevent too many houses being crowded on the area of the town to be planned.

The Town Planning Act allows a Local Authority to

- (1) Prescribe the space about buildings, or
- (2) Limit the number of buildings to be erected, or
- (3) Prescribe the height or character of buildings,

and it will be necessary to prescribe whether one or more of these methods shall be adopted in order to prevent overcrowding or improper use of various areas of land included in a Town Planning scheme.

**Limitation by Bye-laws.**—The existing Bye-laws, as explained in Chapter III., prescribe the space about buildings, the general basis being an open space (which may be a street) in front of a domestic building and another open space (exclusively belonging to the building) at the rear.



The front space has been 24 feet as a minimum, and more usually has been 36 or 40 feet, that being the prescribed width of street. The rear space has been a distance varying from 10 feet in the case of a one-storey building to 25 feet in the case of a tall building, while there have been provisoes securing certain minimum areas in the case of buildings with narrow frontages.

Nothing is said in the Bye-laws as to any proportion of site which can be occupied by buildings, and it has been put forward that the Bye-laws are utterly powerless to prevent overcrowding, since it is possible in favourable circumstances to crowd 40 houses on an acre. Actually, however, the various restrictions of the Bye-laws prevent much more than one-third of the land being covered with buildings, and in order to be able to get as much as one-third of the land covered with buildings it is usually necessary to devote another third to roads.

The following table shows six actual examples of development under the Bye-laws, the seventh line representing an area laid out in the same town before the Bye-law period :—

No. of Houses per Acre.	Average Area of each Building, in Square Feet.	Percentage of Area occupied by Buildings.
3	1,517	10
9	709	16
13	540	17
26	446	27
27	490	31
37	380	32
54	267	41

These figures are not given for the purpose of advocating the Bye-law method of ensuring air-space, but in order to assist in comparison of different methods of limiting the amount of building on a given area.

A slight modification of the ordinary Bye-law method is to require spaces at back and front, each equal to the height of the building or to some fixed proportion of the height.

Another method of prescribing the space about buildings is to state in direct terms the proportion of area which may be covered by buildings—*e.g.*, not more than 20 per cent. of the area is to be built upon.

It may be mentioned that for nearly two centuries there was an English statute which required 4 acres of land to be attached to each cottage, except those built in large towns. This, however, was found to so seriously restrict the building of cottages that the law was repealed in the reign of George III.

If we now take the second suggestion and limit the number of buildings to be erected, we have several problems to face. In the case of a garden suburb or Garden City belonging to a company, as on a private estate, it is possible to make rules or estate regulations which can be interpreted with some amount of elasticity, as the authority attempting to regulate the amount of building is the authority selling or leasing the land, but in the case of a Town Planning scheme, where the Local Authority wish to control building on land which belongs to a number of private owners, various possibilities will have to be provided for as definitely as possible in early stages of the scheme.

Two or three of these points may be glanced at here. First, what area shall be considered? Should the number of houses be fixed for each acre, for each estate, for each section between arterial or other roads? If we start by saying that we will allow 15 houses to the acre as the average for a particular estate or district, we have to face the question, how far shall an owner be able to concentrate these houses on a small area and leave the remainder as agricultural land, allotments, private playing fields, or public parks? If we go to the other extreme and say that all the building plots are to be of equal size, we not only impose a serious restriction on the development of the land, but we insist on some people having large gardens they are unwilling to care for, and we also do something to encourage dull uniformity in building.

Next, what shall the number be? Obviously we ought

to have some regard to the size of building or the number of people it is to accommodate. Then, if some maximum number of houses and some maximum size has been fixed for a particular area, what is to happen about additions proposed to be built at some future date?

The third suggestion as to prescribing the height and character of buildings opens up questions quite as difficult as the others.

To prescribe a maximum height in feet whether the height has to be measured to the eaves, parapet, ridge, or any other level would be somewhat unfortunate as discouraging any attempt at variety in skyline. Probably it would be better to prescribe the height in storeys, although that would need care to give as much freedom as possible without the likelihood of that freedom being abused. One point to have special consideration is the question whether the houses on one side of a street should be lower than those on the other side so as to take advantage of the aspect or the direction of prevailing winds? What, however, shall we say about the "character of buildings"? Probably this has little to do with the point we are now considering, namely, precautions against the crowding of buildings on land, but it may have something to do with the crowding of people in buildings. The "character of buildings" may refer to their classification as domestic, factory, etc., while there are some who hope that artistic merit may be dealt with under the term "character of buildings." *De gustibus non est disputandum*, and when a District Council commences to discuss the architectural fitness of the latest design of the President of the R.I.B.A. or the work of an architectural member of the Royal Academy, the reports of Council meetings in the architectural papers will have an added interest.

**German Zone System.**—A German method of controlling the amount of building on a given area is known as the Zone system. The district is divided in zones or building areas, in each of which there is a fixed limit of height and of built area. Thus in Zone I., near the centre of the town, the buildings may be five storeys high and

80 per cent. of the land may be built upon ; in Zone II. the houses must not be more than four storeys high, and must not cover more than 60 per cent. of the site ; while in Zone III. on the outskirts of the town the houses must not be more than three storeys high, and must not cover more than 40 per cent. of the site. If a method of this kind should be adopted in English Town Planning it would probably be found advisable to reduce the percentages mentioned, but to include half of the street area when calculating the area of the site.

**Letchworth System.**—Another method of limiting the amount of building is to say that not more than a certain number of cubic feet of building shall be put on a given area. A rule of this kind appears to be used in some Garden Suburbs, while at Letchworth the rule for dwelling-houses is as follows :—

Houses costing less than £200,	.	.	12 to the acre,
„ £200 to £300,	.	.	10 „
„ £300 „ £350,	.	.	8 „
„ £350 „ £500,	.	.	6 „
„ £500 or upwards,	.	.	4 „

all these figures pointing to an expenditure of £2,000 to £3,000 per acre. Such a system is, however, hardly applicable to Town-Planning schemes of a Local Authority.

**Relaxation of Bye-laws.**—The question of relaxation of Bye-laws is one which is often mentioned. The suggestion is made that, as an inducement for landowners to allow their estates to be included in a Town-Planning scheme and to be laid out on more generous lines as regards public and private air-spaces, the Local Authority should include in the scheme some relaxation of Bye-laws. This point, however, demands careful consideration. If a Bye-law is unnecessarily severe, the Local Authority should try and get it modified quite apart from any Town-Planning scheme. It is only those Bye-laws which become less necessary owing to estates being developed on more open lines, which should be relaxed in Town-Planning schemes. There are towns where nearly all the suggested relaxations



of Bye-laws are already in operation, for instance, windows are allowed to be flush with the wall instead of being set back  $4\frac{1}{2}$  inches ; party walls are not required to go through the roof ; it is not every town that specifies the height of rooms or requires back lanes or cross-roads at fixed intervals to be provided.

If, in a Town-Planning scheme, each house had to be detached and at a certain distance from its neighbour, then it would be reasonable to relax some requirements which are intended as a precaution against fire, but houses in town-planned areas may be grouped as closely together as in the existing parts of towns.

**Economical Features.**—Looked at in another way the question presents itself—Should a town which has a particularly stringent set of Bye-laws be placed in a better position for bargaining with landowners than a town with more moderate Bye-laws finds itself ?

In connection with the width and construction of streets there are some modifications which appear very desirable in ordinary Bye-laws without regard to Town Planning, but there are other cases where the making of a scheme renders possible some modifications, which could not well be agreed to in the ordinary uncontrolled development of estates. A brief statement of a circumstance which has occurred more than once may serve to illustrate this point. An owner submitted plans for a single new street laid out in such a way that there would be no through traffic. In consideration of the circumstances the Local Authority, although unable to modify their Bye-laws as to width of road, agreed to a rather lighter form of construction than they were in the habit of requiring for roads to be taken over. The owner then came to terms with a neighbour, and they found it was possible by sacrificing two or three plots to make another road leading into the first, and so they converted the original purely residential road into a through-traffic road. Under a Town Planning scheme a Local Authority would probably have much fuller information, and would be better able to judge what area a new road would eventually serve

and what form of construction was suitable. When the question of sewerage is considered it is still more important, that the Local Authority should know how estates are to be developed. At present, large sums of money are spent from time to time in relaying sewers at greater depths or of larger size to provide for their extension to areas not originally intended for building purposes. In some of our towns and suburbs we find streets, which, with a little forethought and co-operation, might have been usefully linked up instead of forming blind alleys. Again, we find estates developed with one main backbone street and a number of short, but monotonous, rows leading out of it, and so we inveigh against these *culs-de-sac*. But we should not let our dislike of these examples lead us to abandon utterly the idea of short roads with no outlet. We can picture to ourselves many delightful places with houses grouped around small squares or courts which afford a turning-place for the traffic, and in some instances have groups of trees, or a fountain, or a monument, or small garden in the centre, and even when the *cul-de-sac* is of a more modest description it may be possible to arrange an outlet for foot passengers.

Opinions will differ as to the amount of detail to be shown on a town plan; some planners will try and settle everything beforehand, others will determine the main lines and leave minor points to be dealt with as they arise. Every street which is at all likely to become an important traffic street should certainly be indicated on the plan, and the positions of public parks and other open spaces will probably have to be defined; in fact, those works which are essential to the satisfactory development of the town as a whole would appear to be necessary to be shown on the plan, while other matters which are of importance rather with regard to the development of estates may, perhaps, be dealt with in the building regulations.

We must remember that, although the Local Government Board have issued procedure regulations, they have not yet issued any set of general provisions for carrying

out the general objects of Town Planning schemes, although the subject is under the Board's consideration. While there is, therefore, very little to guide a Local Authority in framing its schemes, there is not the inertia of stereotyped clauses to handicap the Authority like there is when seeking for amended Bye-laws.

Certain economical features of Town Planning are of great interest, but have sometimes been so misapplied that it seems necessary to dwell on them here.

There is no doubt whatever that the cost of developing an estate depends to a great extent on the number of houses to be built upon it. Some years ago the author made a number of calculations and investigations on this point for the purpose of a report on Housing. Soon afterwards Mr. Raymond Unwin published some more elaborate studies of the cost of developing land for various assumed densities of housing, while doubtless many others had considered the subject more or less systematically.

In his booklet, *Nothing Gained by Overcrowding*, Mr. Unwin gives diagrams, and shows that, assuming that land cost the same per acre and road making cost the same per yard run in both cases, if laid out for different numbers of houses, the following results will be obtained :—

#### TEN ACRES OF LAND.

	Scheme I.	Scheme II.
Number of houses, . . . .	340	152
Cost of roads, . . . .	£9,747 10 0	£4,480 10 0
Cost of land, . . . .	£5,000 0 0	£5,000 0 0
Total cost of land and roads per house, . . . .	£43 7 6	£62 7 5
Price of plot per square yard, .	£0 10 4½	£0 4 9¼

So that, although the price per house is more when the land is developed on open lines, yet the price per square yard of plot is very much less. In fact, a house gets

rather more than three times the size of plot for rather less than one and a half times the money.

The exact difference depends on the assumed value of land and cost of road making.

A point not specially mentioned by Mr. Unwin, but which can easily be deduced from his figures, is that the cost of development is almost the same *per house* in both cases—

$$£9,747 \ 10 \ 0 \div 340 = £28 \ 13 \ 5$$

$$£4,480 \ 10 \ 0 \div 152 = £29 \ 9 \ 6$$

As an example of the misuse which is sometimes made of such figures, the following may suffice. Mr. Unwin's figures are used here by way of illustration, but the enthusiasts who use such arguments probably suggest other figures.

“The cost of developing 10 acres of land on ordinary lines is £9,747 10s., and on Garden City lines it is only £4,480 10s., or £526 14s. is wasted on every acre that is developed, owing to the wicked Bye-law system.”

Now such a statement ignores two important facts. First, that the expenditure of £526 14s. more per acre provides accommodation for about 19 more houses; and second, that both schemes of development comply with the Bye-laws. It may be that in the absence of Bye-laws it would be possible to develop land at a cheaper rate, but in the example just given any such saving is not taken into account, as the roads in both cases are estimated at the same price per yard run.

It would be equally logical to say that common watches and common clocks are sold at half-a-crown each, but while one half-crown clock weighs one pound, it takes seven watches, costing together 17s. 6d., to weigh one pound. Therefore, on every pound of metal used in making watches there is a waste of 15s., owing to the preference some people have for carrying watches instead of clocks.

When considering what can be done in the way of



cheaper development of estates, the following are some of the points which should be taken into account.

Open development will generally, but not always, mean that longer roads, gas, water, and other mains and sewers are required. The cost of sewers will usually increase in greater ratio than their length, owing to the longer sewer having to be deeper, but in the case of other mains the cost will probably be in close proportion to their length.

If a road contains a grass margin or other strip of unpaved surface it may be used for the sewers and mains, thus lessening the cost of reinstating trenches. Such a strip will sometimes allow for planting trees where the branches shall not overhang the metalled part of the road so as to do it injury. Where paths are wide and the foot traffic is not concentrated on a narrow strip it is often economical to have a tar-paved path, or even a gravel path tarred and sanded, in roads where the same traffic would require more substantial material to be used for a narrow path.

In the case of carriageways, while there are many places where a less width than the 24 feet usually specified in the Bye-laws would be sufficient, yet it is not so certain that carriageways of 8 or 10 feet width with occasional passing and turning places, as sometimes advocated, would be found satisfactory in many instances.

In some cases kerbing, and in many cases channelling, might be omitted or formed in cheaper material than is necessary in streets of heavy traffic, but both these items should be considered with reference to the gradient of the road as well as the amount of traffic.

While in some garden suburbs owned by companies and in some Continental towns arrangements have been made for land to be used as front gardens until required for widening a road, it is probable that it will be found desirable in ordinary Town-Planning schemes that the whole width which is intended for a road shall be at once taken into the road, even if it means leaving a wide strip of more or less waste land.

The question of Tramways will have to be taken into

account, but these will be in the main traffic roads, while the preceding notes refer more particularly to the residential roads with little traffic.

The influence of Tramways may be briefly stated to be in the direction of equalising values of land. They increase the value of the outlying areas which they serve, but they may bring down the value of the properties immediately facing the lines, particularly if the roads are narrow. The same remarks apply also to motor 'bus routes.

One of the advantages of a good tramway system will be that the necessity of housing the workpeople close to the factories will be less pronounced. The Town-Planning Act appears to contemplate districts being set apart for various uses, and in many towns it will be considered desirable to limit the factories to certain defined areas. In some cases it will be quite impossible to place all the factories and workshops on one side of the town, but something may be done in grouping them so that we do not find factories and works sending out smoke and dust and noise all over residential neighbourhoods.

If the town planners of to-day do not go as far as Hippodamus and other town planners of ancient times in their ideas of social economics, yet they must pay some attention to the habits of the people and must not expect to revolutionise everything so as to fit in with their ideal schemes. One investigator may find that for Town Planning and town administration the most desirable size of town has about 30,000 inhabitants, but towns will not be limited to that size; another feels satisfied that there are far too many small houses in England, and the British workman should be housed generally in buildings containing two or, perhaps, three families, but the workman still has a desire for a house which he can call his castle, however small it may be; then, again, we know that in very small houses a large living-room would often be much more healthy than two small rooms, one used as a living-room and the other kept as a parlour, but rarely used. So, too, it is urged that the worker ought to live out in a suburb where land is fairly cheap, instead of

clinging to crowded tenements in the town, but the taste for a rural life is not every man's, and the city where, to use Milton's expression, "houses thick and sewers annoy the air" has its attractions for many.

**German Municipal Administration.**—Before concluding this chapter it may be convenient to mention certain features of German municipal administration which should be borne in mind when considering the example of Germany in Town Planning. The Mayor and some of the councillors are appointed for long periods, and are paid for their services to the town. In some towns half the members of the council are paid experts, and hold office for many years, sometimes for life. One advantage of such a system is the continuity of policy. A Mayor has the chance of thoroughly studying a scheme and then carrying it out, instead of rushing through a half-considered scheme or spending so much time on elaborating it that his period of office expires and he has to leave it to be carried out by his successor whose attitude toward it may or may not be sympathetic.

Next, a word must be said about the method of electing councillors. In some towns there is what is known as the three-class system, the electors being divided into three classes, according to their wealth, and each class then elects one-third of the members. This gives what would in England be considered undue weight to the opinions of the rich classes, but, on the other hand, the richer classes probably pay a greater share to the town expenditure than they do in England. The rating is not according to the size of house, but is based upon the Income Tax. A man earning £40 per annum has to pay income tax in Germany, while in some Continental countries the limit is even lower than this. The town collects the income tax for the Central Authority, and then instead of ordinary rates it charges so many times the income tax after making certain allowances in the case of the smaller incomes. The fact that rates are not charged directly upon the house might be expected to help in the provision of houses for the poorer inhabitants, but possibly this is

to some extent neutralised by the imposition of certain taxes on buildings for supervision during erection, for drainage, and for removal of house refuse, etc., instead of including such expenses in the ordinary town tax.

The last of these points of difference to be noted in the conditions of German and English town administration and policy is the question of land purchase. In German towns there is often a large proportion of the land in the possession of the Municipality. A town frequently mentioned in this connection is Ulm in Würtemberg, where at present over 80 per cent. of the land belongs to the town, but this is by no means the only instance of extensive land purchase by the towns. In Frankfurt very nearly half the land belongs to the town, and in all parts of Germany south of Frankfurt large proportions of the town areas are public properties. In English towns such a state of things is exceptional, indeed some towns do not even own the land occupied by their public offices. It remains to be seen how far the Town Planning Act will be used for the purchase of land. It is not probable that the Local Government Board will allow Town Councils to speculate in land in the way that German towns do, but, on the other hand, it may be anticipated that a little more liberty will be accorded and that it will not be necessary in every case to specify exactly what is to be done with each piece of land which a town desires to buy.

**Effect of Bye-laws and Town Planning Schemes Compared.**—The mere making of a town plan will not do more to ensure the proper development of estates than the making of a new set of Bye-laws would. The Bye-laws do not compel anyone to build, but they say that if you do build you must comply with the rules and restrictions. If the rules and restrictions are unduly lax you do not get uniformly good building ; if the rules and restrictions are unduly severe you do not get much building of any sort. It is true that there are some owners who will adopt a higher standard than the Bye-laws require, and, on the other hand, there are those who will aim at a bare pass, while a few individuals will go on their way designing



their buildings on what they think satisfactory lines without allowing their genius to be influenced or fettered by such considerations as the necessity of complying with Bye-laws. In spite of these exceptional features we may say that the general result of Bye-laws is to prevent the worst class of work without encouraging the very best work.

Now with regard to Town Planning very much the same may be said. The preparation of a Town Planning scheme will not compel anyone to develop his estate, but will only mean that when he does develop it, he must do so in a certain way. If the town authorities want a particular road to be made before the owner thinks fit to make it, they must in some way pay for it.

The making of the plan will prevent haphazard development, and to this extent it should benefit all parties, for "much evil is wrought for want of thought," but whether the result is the best possible or merely the avoidance of the worst possible will depend on the plan and the scheme which is prepared.

The success of the plan will depend not only on the skill of the technical advisers, but also on the friendly co-operation of many interested parties, and not only of those who are financially interested, but also of others who have at heart the well-being of the town from a sociological or artistic standpoint.

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## CHAPTER VI.

## A TOWN PLANNING TOUR.

London — Letchworth — Cambridge — York — Edinburgh — Glasgow —  
 Liverpool — Belfast — Dublin — Cork — Plymouth — Havre — Caen  
 — Paris — Marseilles — Lisbon — Lucerne — Berne — Munich —  
 Frankfurt — Dresden — Berlin — Brunswick — The Hague —  
 Amsterdam — Antwerp — Louvain — Liege — Verviers — Brussels  
 — Ghent — Bruges — Ostend — Conclusion.

Now, having looked at some of the problems of Town Planning, having recalled to mind the works of Nero and Nebuchadnezzar, of Wren and Vitruvius, of L'Enfant and Hippodamus, having glanced at the building regulations of Ancient Rome, and considered more fully the model Bye-laws and the Town-Planning Act, let us, before our minds become burdened with details of work and our imaginations dulled by procedure regulations, take a holiday and, visiting some towns of Western Europe, see what impressions we get bearing on our recent studies.

**London.**—In London we see examples of street improvements carried out at enormous cost, much of which would have been saved if a smaller amount of money had been spent in early days in securing wide streets for the future traffic. We may also see three distinct classes of Town Planning—first, the estates of certain large landowners who showed some foresight 100 years ago, and laid out the streets and squares of the Bloomsbury district on formal and fairly liberal lines ; then there are the districts like Bedford Park where about 30 years ago purely residential areas were planned with the houses generally detached and standing in ample grounds, and where the streets are arranged so as to discourage through traffic ; while, lastly, we have the more recent garden suburbs, such as Hampstead and Gidea Park, where there is a greater variety of size and character in the buildings and far less formality

and restraint. We may trace the change from the planning by a single landowner to the later development by co-operative societies, and even in the class of footpath we may note a definite sequence, from substantial stone-paving in Bloomsbury to tar paths suitable for the smaller traffic of Bedford Park, and then to gravel paths, cheaper in first cost, and, perhaps, sufficient for the immediate needs of some newer suburbs.

**Letchworth.**—Leaving London we go north, and on passing Letchworth we note a town in building, not because there was an overflowing population in the neighbourhood, nor because great works were about to be established and the workers needed housing. It is more a huge experiment where minor experiments can be carried out. The general idea of the plan of the town was thought out before the site was chosen, and, although various modifications were made in the scheme from time to time, yet the principles remain as elaborated by Mr. Howard and his friends. It is not the object of this chapter to give complete accounts of the towns noticed, but to lay hold of one or two points associated with each place visited, and, while we may note the foresight, energy, and enthusiasm of the promoters, we must also remember that some of the houses which appear scarcely worthy of the Garden City are the results of an exhibition held at Letchworth when practically anyone who wished to experiment in housing was allowed to do so.

**Cambridge.**—Coming on to Cambridge we find an ancient town with an old-fashioned market-place and narrow crooked streets in its centre, but with extensive commons and other public spaces and generally open development. The avenues of trees at the backs of the Colleges and elsewhere offer a delightful sense of repose at a few minute's walk from the busy part of the town. Some of the estates compare favourably with the modern garden suburbs, but while they may have, perhaps, 10 houses to the acre, and so be free from the reproach of overcrowding, yet there is sometimes an unfortunate monotony in the houses, and,

though individual roads may be satisfactory, they do not form part of one general scheme. In the older parts of the town we may sometimes regret that exceptionally fine buildings are placed where they cannot be seen to advantage, and yet they present many charming views to the pedestrian who wanders through the narrow streets and threads his way into still narrower passages.

**York.**—If we pass on to York we have another instance of the growth of old towns. There is the city with its narrow streets and fine buildings; there are the large “strays” and a garden suburb. There is a wealth of material for the town planner, and we must not forget that York was the city chosen for intensive study by Mr. Rowntree when considering the Housing Question and Poverty in Provincial Towns.

**Edinburgh.**—Now we approach Edinburgh, a city where Town Planning is no novelty, but where opinions as to the planning differ according to the temperament of the critic. R. L. Stevenson may be quoted upon four distinct points connected with our study.

*The Site.*—“No situation could be more commanding for the head city of a kingdom; none better chosen for noble prospects.”

*The Old Town.*—“It grew under the law that regulates the growth of walled cities in precarious situations, not in extent, but in height and density. Public buildings were forced, wherever there was room for them, into the midst of thoroughfares; thoroughfares were diminished into lanes; houses sprang up storey after storey, neighbours mounting on neighbour’s shoulders, as in some Black Hole of Calcutta, until the population slept fourteen or fifteen deep in a vertical direction. The tallest of these *lands*, as they are locally termed, have long since been burnt out; but to this day it is not uncommon to see eight or ten windows at a flight; and the cliff of building which hangs imminent over Waverley Bridge would still put many natural precipices to shame.”

*The New Town.*—“It cannot be denied that the original design was faulty and short-sighted, and did not fully



profit by the capabilities of the situation. The architect was essentially a town bird, and he laid out the modern city with a view to street scenery, and to street scenery alone. The country did not enter into his plan ; he had never lifted up his eyes to the hills. If he had so chosen every street upon the northern slope might have been a noble terrace, and commanded an extensive and beautiful view. But the space has been too closely built ; many of the houses front the wrong way, intent, like the Man with the Muck Rake, on what is not worth observation, and standing discourteously back-foremost in the ranks ; and in a word it is too often only from attic windows, or here and there at a crossing, that you can get a look beyond the city upon its diversified surroundings."

*The Suburbs.*—"Day by day, one new villa, one new object of offence, is added to another ; all around Newington and Morningside the dismallest structures keep springing up like mushrooms. . . . They are not houses ; for they were not designed with a view to human habitation, and the internal arrangements are, as they tell me, fantastically unsuited to the needs of man. . . . Indifferent buildings give pain to the sensitive, but these things offend the plainest taste. It is a danger which threatens the amenity of the town, and as this eruption keeps spreading on our borders, we have ever the farther to walk among unpleasant sights before we gain the country air."

**Glasgow.**—The huge conglomeration of buildings which Defoe once described as the "Beautifullest little city I have seen in Britain." Tall houses, narrow streets, some fine buildings, and a few wider streets would be a fair description, but hardly peculiar to Glasgow. Perhaps we should emphasize the tallness of the buildings and also mention the tramways and parks. There is an area planned on distinctly rectangular lines in spite of the hilly streets. The district referred to extends for half a mile west of Buchanan Street. There is a distinct civic centre at George Square, where the Municipal Buildings occupy over an acre of ground. George Square itself

contains the statues of ten distinguished Scotsmen who all turn their backs upon Sir Walter Scott, while there are equestrian statues of Queen Victoria and the Prince Consort, so that there is an amount of statuary quite unusual for a British town square.

**Liverpool and District.**—Coming back to England, we may look in at Liverpool, and find in the city and neighbourhood many features of great interest to town planners. First of all, we have the well-known circular roads, such as Menlove Avenue and Queen's Drive, then there is a small garden suburb at Wavertree, while apart from actual examples of work we may note that Liverpool University has done more than any other to encourage the study of Town Planning by establishing a Department of Civic Design.\*

A few miles away, at Southport, we have a town which shows distinct evidences of systematic planning, and has in Lord Street one of the widest streets in Britain, and in one working-class district we may observe the prevalence of semi-detached houses in marked contrast to the long rows so often complained of.

Then, closer still to Liverpool, we have Birkenhead, which has already been mentioned as an example of early nineteenth century town planning, and where Port Sunlight is a type of the garden suburb laid out by a great manufacturing firm.

**Belfast.**—Crossing over to Ireland we find Belfast a fine modern city which has done wonders in the way of getting wide streets, and whose City Hall will bear comparison with that of Glasgow.

**Dublin.**—Dublin, the political capital of Ireland, boasts one of the largest parks of Europe, and in Sackville Street it may be said to have one of the finest streets. There are some very good buildings, but, as in so many towns, they are not always well placed.

**Cork.**—Then there is Cork where we may contrast the formal appearance of the Mall with the pleasing effect given by a slight irregular curve, the otherwise commonplace Patrick Street.

\* See page 126.

**Plymouth.**—Returning from Cork to Plymouth we have in the Sound a magnificent harbour overlooked by the Hoe, probably the finest promenade to be found in any English port, and from the Hoe we may also look over the town towards the Dartmoor Tors. But Plymouth, or rather that group of habitations known as the Three Towns, needs this roominess to compensate somewhat for certain overcrowded areas. It is not only in the statistics of the district that we detect indications of the density of population, for a distinguished American visitor\* observed this and wrote, “ Viewed from the far vantage of some rising ground, the three towns of Plymouth, Stonehouse, and Devonport, which have grown together to form one Plymouth, stretched away from the sea in huge long ridges, thickly serried with gables and bristling with the chimney pots of their lines of houses. They probably look denselier built than they are through the exaggerative dimness of the air, which lends bulk to the features of every distant prospect in England ; but for my pleasure I would not have had the houses set any closer than they were on the winding sloping line of the tram we had taken . . . and after it had carried us through rows and rows of small low grey-stone cottages, each with its pretty bit of garden at its feet, it bore us on to where their strict continuity ceased in detached villas.”

**Havre.**—From Plymouth we may in imagination cross over to Havre, a French port dating from the sixteenth century. Some parts are laid out on formal lines, we may note particularly the district near the Theatre where rectangular planning prevails and the streets are appropriately named after Moliere, Corneille, etc. There are also several boulevards and squares, some of which offer us examples of how important buildings should be given noble sites and not be hidden away, as in so many of our own towns.

**Caen.**—Only a few miles from Havre is the ancient town of Caen, a town of peculiar historic interest to Englishmen, for it contains buildings founded by William the Conqueror

\* W. D. Howells.

and Matilda, while the town received its charter from King John and the University was founded by Henry VI. We find some most interesting old buildings, but the majority of the streets are exceedingly narrow and winding. There are some portions with wider streets, but these are not adorned by such architectural treasures. We may note the roads and paths paved in a way that would hardly be tolerated in an English town of equal size, and yet the people are not afraid of modern developments, for electric tramcars twist through the narrow streets, and a cinematograph show is almost within the grounds of William the Conqueror's Abbey Church.

**Paris.**—From Caen we go by train to Paris, a city that looms large in the history of street improvements, for it is estimated that the expenditure by Haussmann on the reconstruction of central Paris between 1853 and 1869 amounted to £85,000,000.

This, in itself, may serve as a reminder that we are not to look to such cities for our chief examples in Town Planning. We may rather look at Paris and London as cities where immense sums of money have been needed to remedy the lack of foresight in ancient days, while in Paris we have the further examples of what can be done by steady determination of one or two strong men. We must not forget that Bacon's dictum may be applied to Town Planning. It is better to be ruled by one than to be distracted by many advisers.

Turning to practical lessons from Paris streets, we may note first the usual Continental conversion of the sites of fortifications into fine boulevards, but perhaps in few other cities has so much been done and well done in axial planning. Whether we look at a long centre line like that through the new Pont Alexandre III. and the Hotel des Invalides or at the carefully balanced arrangement of streets at the Place de l'Opera we find this feature. To my mind this is rather overdone at the Rond Point de l'Etoile, just as the radiating system seems to be carried to an extreme in Karlsruhe, but was there ever a system which was not carried too far to please some people?



The magnificent buildings, old and new, will tempt us from the study of Town Planning proper, while even the sewers are an attraction to visitors interested in municipal work, for where else do you find an electric train to convey you through these underground passages?

**Marseilles.**—There are two southern towns I should like to include in our imaginary tour before we pass into Switzerland and Germany. Marseilles is the oldest French town of which we have any record, and we have come across the name in our readings from Vitruvius. It is now the most important seaport of France, but part of its interest to the town planner is due to the endeavours which are being made to carry straight roads through some of the older parts and to the wide tree-planted avenues which have been provided immediately outside the central portions of the town. Many parts are laid out on a more or less rectangular plan, but there is not that grading in width which one would like to see. The Cannebière and its prolongation form a grand street with luxurious hotels and shops toward the lower end, but there is not that closing-in of vista at either extremity which might be looked for. On the other hand, the Boulevard Longchamp leads to the charming Façade of the Palais Longchamp. Apart from the disposition of its streets, Marseilles is of interest because of its buildings, and not least prominent is Notre Dame de la Garde, while the tramway system deserves note for its extent and cheapness.

**Lisbon.**—The other southern town is Lisbon, beautifully situated and of fine appearance when viewed from the harbour, with some fine squares, good parks, and one great avenue, the Avenida da Liberdade, something like a mile long and 80 yards wide, but commencing as a narrow street by the railway station, where the chances of a widening seem remote. There are at least two other avenues which terminate in somewhat the same way, and it is on account of these features that the city, which lies out of our route, has been mentioned.

**Lucerne and Berne.**—Now we get back from the torrid streets of the south to Switzerland and note two towns,

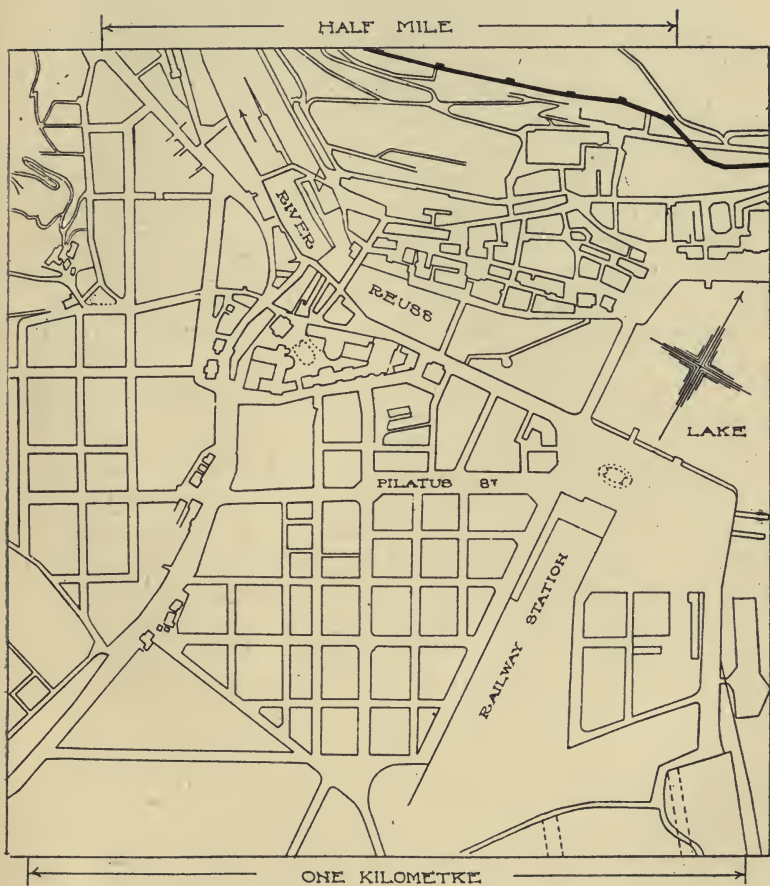


Fig. 7.—Town with Two Distinct Types of Planning  
(Lucerne, Switzerland).

The older part of the town on the right bank of the river is picturesque and irregular. The planning of the newer part on the left bank is on rectangular lines with wider streets and larger blocks of buildings.

The plan shows formal planning in contrast with erratic growth.

one Lucerne, with an old part where traces of the town walls may yet be seen and a new part laid out on rectangular lines. There is an avenue here, very different from that of Lisbon, but very pleasant is the promenade by the side of the lake with the dwarfed trees just above your head. Then at Berne we have quite different conditions, instead of a plain a few feet above the lake we find a town on the tongue of high ground in the loop of the river; there is a pleasing feature we have not mentioned in the other towns visited, the arcaded paths along the street, reminiscent of the rows at Chester or the Butterwalks in Devonshire rather than the more formal arcades of Paris. Then we may note the two steel arch bridges, evidence of modern science, and between them we find a quaint clock-tower record of earlier art. Many of the newer parts of the town are planned on formal lines, and some are rather successful, but in themselves would hardly attract the town planner.

We are nearing Germany, the home of Town Planning for many years, and doubtless we could find in German towns examples of most of the features which we have deemed noteworthy in other towns visited, but I have sought rather to associate some more or less definite point with each town. In Germany a few remarks or quotations from various writers must suffice, and we may start with one from *Romantic Germany*.

**Munich.**—"My first impression of Munich was of a place simply irradiated with the love of beauty. The principal streets, old and new, seemed as exquisitely calculated for effects of vista as the streets of Danzig; the squares, with their old tower gates and churches and massed houses, were grouped as if composed by the eye of a painter." There are those who speak of Munich in very different terms, and profess to see in the public buildings of the city poor copies of famous Italian buildings, but it is well sometimes to enjoy what is before us rather than be always criticising and contrasting.

**Frankfurt.**—We pass by Karlsruhe and Heidelberg, while at Frankfurt we can not only view the city, but

also study the following statement by Sir W. H. Lindley as to principles which guided him in the planning of much of the modern town. "In these designs three important principles are kept in view ; first of all, engineering considerations, direct communications between important parts of the city, careful alignment and development of grade in hilly districts, and due regard to creating streets running in the proper direction with favourable levels and slopes for important lines of drainage, interceptions, and rain outlets. Secondly, hygienic considerations, the provision of adequate open spaces is foreseen, and building so regulated that light and air are given free access. Thirdly, artistic considerations ; thus, for instance, at Frankfurt, streets are laid out, keeping open the view to the beautiful range of the Taunus Mountains and to buildings of historic and artistic value, while fine and dominating sites are reserved for public buildings, schools, and so forth. Besides this, certain quarters suitably situated are laid out with special regard to certain purposes, and reserved for the same ; thus, for example, for business quarters, residential quarters and villas, quarters for the middle and the poorer class, and districts for factories and industrial purposes."

**Dresden.**—The quaint old-world town of Leipsic and the smaller historic towns in the Thuringian States might well delay us, but even the great art centre of Dresden must be dismissed with a few words. We have in Dresden a northern town in the bend of the Elbe laid out on a radial plan, and other districts on rectangular lines, while the central area is less regular, so that there is an opportunity of comparing the use made of various guiding principles of planning in a city which has at more than one period been noted for its artistic tendencies.

✓ **Berlin.**—And now we come to Berlin, a great metropolis almost aggressively imposing, and possessing really some very fine streets, large parks, magnificent buildings, and yet to many minds there seems a want of cohesion in the city.

There are large areas planned on formal lines, but if



one feature is to be selected for special note it must be the extensive use of statuary in the streets and public places. This is a point not hitherto mentioned in connection with the Continental cities visited, but in Berlin we have statues and monuments of all descriptions and of varied materials, groups and single figures, recumbent and seated, on horseback and on foot, in marble, bronze, zinc, and copper.

**Brunswick.**—After leaving modern Berlin we move on to mediæval Brunswick.

The writer of *Romantic Germany* says “a deal of Brunswick’s charm is due to its street plan. Many of the old cities, founded by pure Teutonic stock in the south and west of Germany, developed from a group of houses muddled together without rhyme or reason—an arrangement called *Haufendorf* or *Heap-village*. On the other hand, the Slavic cities of the east were laid out on a deadly rectilinear plan as monotonous as Manhattan’s sorry scheme of things.

“In Brunswick these two influences complemented each other and produced a plan both of irregular curving streets and of far vistas—a plan that surpasses the others as a design by Dürer surpasses a design by a cliff dweller or by Euclid. And Brunswick has known better than most cities how to keep her scheme pure of modern improvements.”

✧ **The Hague—Amsterdam.**—Let us now leave Germany and enter the Low Countries. In Holland we might expect to find formal plans, since there are no hills to force or even to suggest irregular lines for towns and their streets. We can indeed find small areas in several towns and practically the whole of The Hague, where the plan is simple and more or less straight-lined, but such does not appear to be at all general. We may note one point in several Dutch towns, and particularly at Amsterdam. The town is arranged in concentric belts, not simply on a radial plan with some ring streets connecting the spokes of the wheel, but more comparable with the rings of a tree section, where medullary rays here and there break through from ring to ring. We can imagine a canal to

be made encircling the town, then buildings grow up each side of the canal, and later on another canal is formed with more buildings until we have a clearly marked concentric plan.

Although Dutch towns are often picturesque and most of them have historical associations of absorbing interest, yet the influence of the canal upon the street plan is too pronounced for English town planners to be able to derive very much profit from their study.

**Antwerp.**—We may leave the Holland, which Napoleon described as the alluvium of French rivers, and pass into Belgium, which another ruler said was one great town. Antwerp has a central area which has been described as a maze without a plan, but it has a series of wide avenues starting from the southern station, and the Quartier du Sud is a distinct modern area planned on rectangular lines with some diagonals, while outside the fortifications a garden suburb is in course of development. There is scarcely an old building which can be properly seen from the street, and the famous cathedral is badly hemmed in by houses, but some of these are being removed and the Palais des Beaux Arts and one or two of the other modern buildings are splendidly placed. In this town we can well study the influence of irregular curved street lines, and may compare the effect of meandering streets and varied buildings with that of more formal streets of more uniform buildings.

**Louvain.**—Louvain is approximately circular, and has in the centre one of the finest town halls in a country which is celebrated for its magnificent civic buildings. The station is far away on the circumferential boulevard, and to the north of the road from station to Hotel de Ville is the modern built area. It is interesting to compare Louvain with Caen and Cambridge, which we have already visited, and indeed these are not the only university towns to which we might give the same general description, although each has its own features. They are situated in plains on small rivers, have populations of about 50,000, and possess fine old buildings, but generally narrow

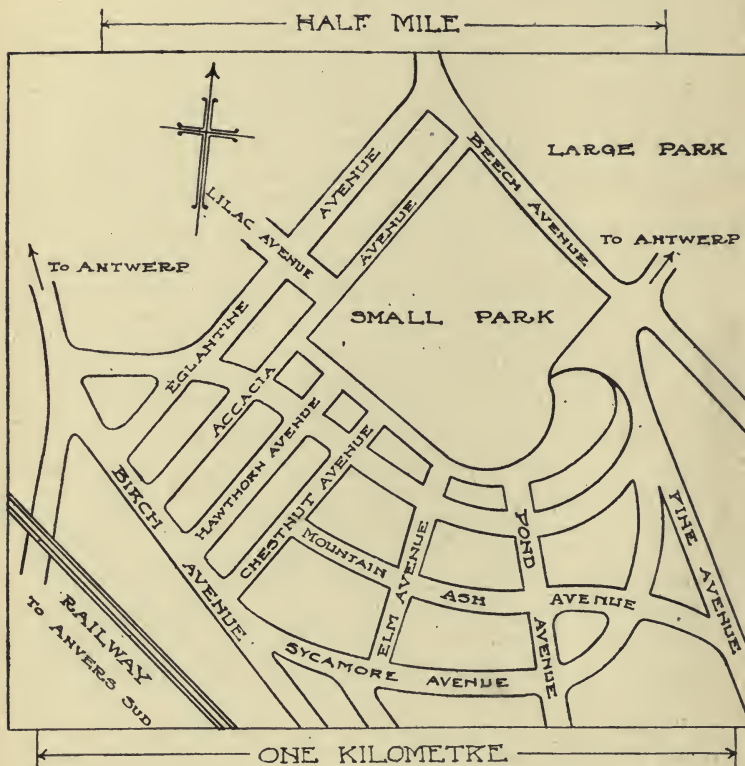


Fig. 8.—Plan of Garden Suburb, Antwerp.

This suburb is being developed outside the fortifications, the roads are named after the trees with which they are planted.

Compare the plan of Philadelphia with this. In each there are streets named after trees, but the curved street lines at Antwerp are in marked contrast with the rigid block system of Philadelphia.

crooked streets, while there is no central position for such a modern affair as a railway station.

**Liege and Verviers.**—By journeying toward the east frontier we should find at Liege a handsome modern city in spite of its ancient historical associations, and at Verviers there is the only town in Belgium where tenement buildings prevail to any very great extent. We must, however, pass on to Brussels, which is not only the capital of the country, but is of very great interest to the town planner.

**Brussels.**—It may be thought that whatever lessons Brussels has to suggest may be learned equally well at Paris, but there are at least three points which present themselves more specially at Brussels. We can see the great improvements actually in the making, whereas at Paris so much was done a generation ago. These works are carried out not by the forceful policy of Napoleon and Haussmann, but under a democratic rule, where many opinions and many votes have had to be considered. Thirdly, there are greater variations in level of ground than are found in central Paris, and, therefore, the conditions are more like those of many English towns.

It is not only the street works now being carried out in the old town which appeal to us, for we can find old buildings and old streets untouched by these improvements, and we can also find important districts laid out on modern lines. Whether we wish to see places or parks, street statuary or monuments, gardens or woods, old buildings or new, imposing or quaint, public or private, we can find them here.

The Municipality has not only paid for old private buildings of interest to be preserved, but has also given prizes for designs for new buildings, and the late King Leopold did much to help in the beautifying of his capital.

Even if we are chiefly interested in the possibilities of setting apart districts for various purposes, there is something to be studied here in the positions of the Royal Palaces and Parliament buildings, the principal shops, the markets and docks, the residential quarters, and the poorer districts.



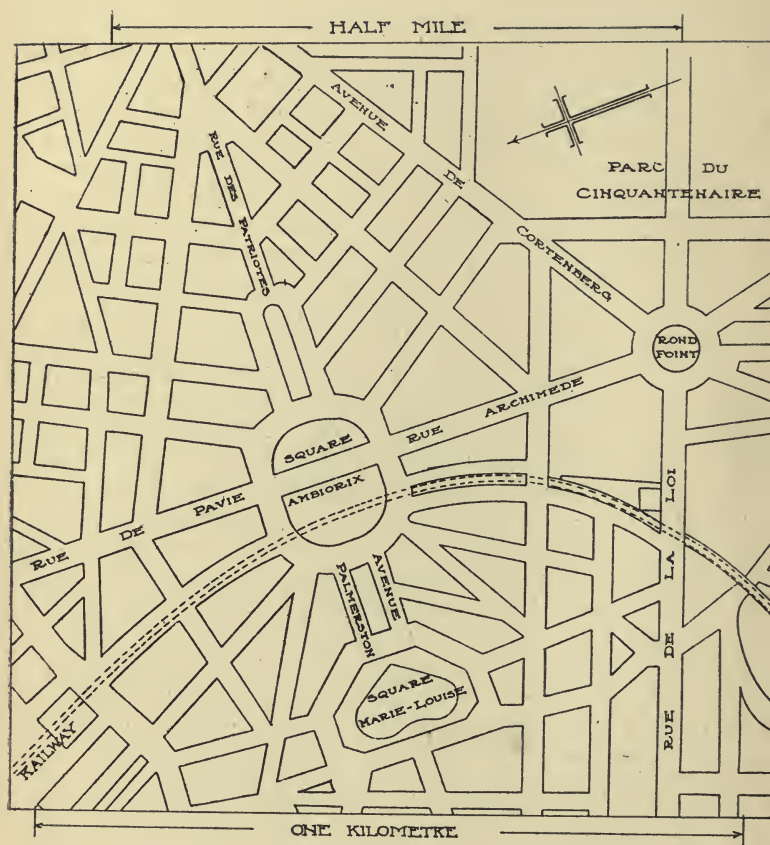


Fig. 9.—Example of Axial Planning, Brussels.

This part of Brussels is of modern growth, and is laid out on formal lines, but not usually rectangular. It will be noted that two main axes are used, one leading from the Avenue des Arts to the Parc du Cinquantenaire, and a more imposing one through the Square Ambiorix.

It is a good example of comprehensive planning with greater flexibility of design than is shown in the plan of Philadelphia.

**Ghent and Bruges.**—Ghent, Bruges, and Ostend should all be visited and compared. The historical interests of the first two will ever throw a glamour over them and make it difficult to say sometimes how much of the charm we feel in visiting the town is due to antiquarian or architectural interest and how much to the curves and irregularities of the street lines. But these three towns may be taken as showing three town developments within a short distance and in a country where civic enthusiasm has been intense. At Bruges we have a town which was perhaps the greatest commercial centre of Europe and now has shrunk to insignificance in commerce. Its population being so much reduced there has been little need for street improvement works, and as we walk through the town we feel that such works would be almost sacrilegious.

Then at Ghent we find a town which, owing to its good position on the railway system, has been saved from the fate of Bruges, and, although not now the chief manufacturing city of Europe, is still of importance. Here we can note some modern works blending with the old.

**Ostend.**—After these mediæval cities we come to Ostend, a town of recent growth on the site of an older town, a town without any great natural advantages, and where the factors which have led to its success are sociological. The site is low-lying, rendering ordinary methods of sewerage impossible, but the town is a good example of what can be done in unfavourable circumstances. Ostend is almost entirely rectangular in its street planning, but is not large enough for the disadvantages of that system to be very apparent. The provision of open spaces and parks and the proximity of the sea give the place a sense of roominess, and, while we may note one feature common to all Belgian towns, the naming of streets in both French and Flemish, we may also note that in one district there is a group of street names arranged on a definite system, for we find Rue de Rome, Constantinople, Stockholm, St. Petersbourg, etc., in fact half the capitals of Europe are represented in this cosmopolitan resort, and even Babylon and Cairo are not forgotten.

Ostend cannot compete with Bruges or Ghent in its antiquarian or artistic interests, but is not the less worthy of the town planner's attention.

**Conclusion.**—And now we return to our own country and to our own town, a town where we spend not merely a few days or weeks, but a lifetime. Let us study it afresh, gathering from other towns hints as to what to avoid and what to aim at, but above all seeking to develop its own characteristics rather than to imitate others. We shall find it necessary to do much preliminary work, investigating the physical conditions, the present lay-out, the habits and social organisation of the people, and, though at times we may become impressed with the imperfections of the Town-Planning Act, the delays in procedure, the weakness in operation, we may eventually come to regard even these things as blessings in disguise, preventing us from doing anything rashly, and forcing us to adopt that measure of deliberation which is appropriate to the building of a city rather than the planting of a garden.

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## APPENDICES.

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### I. GARDEN CITIES.

### II. ENGLISH EXAMPLES OF TOWN PLANNING—

(a) Municipal Schemes.

(b) Private Estates.

(c) Copartnership Estates.

### III. PROGRAMMES AND RESOLUTIONS OF CONGRESSES, SCHEDULE OF TOWN PLANNING ACT.

### IV. BOOKS AND PAPERS ON TOWN PLANNING, AND OTHER BOOKS CONSULTED OR QUOTED FROM.



## APPENDIX I.

## GARDEN CITIES AND GARDEN SUBURBS.

THE preceding chapters have dealt principally with towns in the ordinary sense of the word, but it is of interest to note the recent development of Garden Suburbs.

Not only is the Garden Suburb the particular phase of Town Planning which, in England at least, has made the greatest impression on the public mind, but it is quite likely that the Town Planning schemes promoted by municipalities will in many instances be skeleton schemes, with little more than the main and a few secondary roads planned by the Local Authority, and that the areas enclosed between these roads will afford opportunities for treatment on much the same lines as Garden Suburbs.

In August, 1912, a letter from Mr. E. G. Culpin, the Secretary of the Garden Cities and Town Planning Association, was circulated in the public press in order to call attention to the misuse of the term "Garden City" when applied to very small areas. Mr. Culpin defined the essentials of a garden city as distinct from a garden suburb and from ordinary development as follows :—

"(1) That, before a sod is cut or a brick is laid, the town must in its broad outlines be properly planned with an eye to the convenience of the community as a whole, the preservation of natural beauties, the securing of the utmost degree of healthfulness, and proper regard to communication with the surrounding district.

"(2) That in the town area the number of houses should be strictly limited, so that every dwelling should have ample light and air, with a suitable garden, and that public recreation ground and open space should be provided generously.

“(3) That a town area should for ever be surrounded by a belt of agricultural and park land, so that while in the centre the urban problem is being dealt with, the rural portion, which should be the larger part of the estate, may be available for farms and small holdings, in order that the small holder and market gardener may have a new market direct to hand for the sale of produce.

“(4) That the return on capital should be limited to, say, 5 per cent., any profit above that amount being applied to the estate itself for the benefit of the community.

“(5) That the town should not be merely residential, but also commercial and industrial, that provision should exist for taking the worker and his work away from the crowded centres into the fresh air of the country district, where not only should the land be cheaply obtainable for the employer, but the worker should have a comfortable cottage at a convenient distance from his labour.

“It is, therefore, essential that the land should be of considerable area, and its development should be in the hands of one controlling body, which, in Mr. Howard's scheme, should have for its ultimate object not the making of huge profits, but the improvement in the conditions of life for all who live in the area. The estate should be somewhat from 6 to 10 square miles in area, and in order to give effect to the desire for the combination of town and country about two-thirds should be reserved for the rural area.

“It will be seen at once how absurd is the designation ‘Garden City’ when applied to 14 acres of land.

“A ‘Garden Suburb’ provides that the normal growth of existing cities shall be on healthy lines, and when such cities are not already too large, such suburbs are most useful, and even in the case of overgrown London they may be, though, on the other hand, they tend to drive the country yet farther afield, and do not deal with the root evil—rural depopulation.

“‘Garden Villages,’ such as Bournville and Port Sunlight, are garden cities in miniature, but depend upon some neighbouring city for water, light, and drainage ;

they have not the valuable provision of a protective belt and are usually the centre of one great industry only.

“The ‘Garden City,’ therefore, stands as the preventive, not as the palliative.”

In the restricted sense suggested by this definition there is only one Garden City in England, that at Letchworth. In a much wider sense such old towns as Oxford and Cambridge have been described as Garden Cities, although in spite of their open development and abundance of open spaces, they cannot be described as town-planned areas.

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## APPENDIX II.

## ENGLISH EXAMPLES OF TOWN PLANNING.

THE following short list includes English examples of recent Town Planning of various kinds.

*Municipal Schemes.*

Birmingham and Ruislip-Northwood (Middlesex) are the only two authorities whose schemes have already been approved by the Local Government Board, but the preparation of several other schemes has been authorised, and the Middleton Authorities have been allowed to adopt a scheme prepared by owners.

In January, 1914, the Local Government Board issued a memorandum showing the progress of schemes to 31st December, 1913.

Stage.	Number of Schemes.	Number of Authorities.	Acreage Involved.
Schemes approved, . . . .	2	1	3,762
Schemes awaiting approval, . . .	3	3	6,503
Schemes authorised to be prepared, . . .	47	37	70,900
Other cases awaiting authority, . . .	14	14	29,761
Total, . . . .	66	55	110,926

Both the schemes mentioned as approved by the end of 1913 were for Birmingham, but early in 1914 the Ruislip-Northwood scheme was approved.



*Manufacturers' Estates, etc.*

Bournville,  
Earswick,  
Garden Suburb,  
Port Sunlight,  
Woodland, etc.,

Birmingham,  
York,  
Hull,  
Birkenhead,  
Doncaster,

Messrs. Cadbury.  
Messrs. Rowntree.  
Messrs. Reckitt.  
Messrs. Lever Brothers.  
Colliery Companies.

*Other Estates.*

First Garden City Letchworth is the one example of an independent planned town with varied manufactures in addition to the residential areas. Examples of Garden Suburbs and Garden Villages are found in the following neighbourhoods :—

Birmingham.	Cardiff.	Chester.	Dovercourt.
Ealing.	Hampstead.	Keswick.	Knebworth.
Leicester.	Liverpool.	Manchester.	Romford.
Sevenoaks.	Stoke-on-Trent.	West Hyde (near Luton).	Wolverhampton.

At several of the places mentioned there are estates associated with a useful organisation known as Copartnership Tenants, Limited. In some cases the whole of the suburb belongs to the affiliated societies, while at Letchworth only a very small part of the area is controlled by Copartnership Tenants.

At 31st December, 1913, there were 14 affiliated societies with estates amounting to 916 acres intended for 10,053 houses or about 11 per acre. The estimated cost of estates, including land and buildings when completed, is £3,274,143, which works out at £3,574 per acre or £326 per house.

Of the 916 acres, it is intended to set apart about 100 acres, or, say, 11 per cent. of the total area for open spaces.

## APPENDIX III.

PROGRAMMES AND RESOLUTIONS OF CONGRESSES,  
SCHEDULE OF TOWN PLANNING ACT.

THE following notes give some indication of the principal points which, according to various authorities, require to be considered in Town Planning :—

(a)

The Fourth Schedule of the Town Planning Act of 1909 enumerates nineteen matters to be dealt with by *General Provisions* prescribed by the Local Government Board.

1. Streets, roads, and other ways ; stopping up or diversion of existing highways.
2. Buildings, structures, and erections.
3. Open spaces, private and public.
4. The preservation of objects of historical interest or natural beauty.
5. Sewerage, drainage, and sewage disposal.
6. Lighting.
7. Water supply.
8. Ancillary or consequential works.
9. Extinction or variation of private rights-of-way and other easements.
10. Dealing with, or disposal of, land acquired by the responsible Authority or by a Local Authority.
11. Power of entry and inspection.
12. Power of the responsible Authority to remove, alter, or demolish any obstructive work.
13. Power of the responsible Authority to make agreements with owners, and of owners to make agreements with one another.
14. Power of the responsible Authority or a Local Authority to accept any money or property for the further-

ance of the object of any Town Planning scheme, and provision for regulating the administration of any such money or property, and for the exemption of any assurance with respect to money or property so accepted from enrolment under the Mortmain and Charitable Uses Act, 1888.

15. Application with the necessary modifications and adaptations of statutory enactments.

16. Carrying out and supplementing the provisions of this Act for enforcing schemes.

17. Limitation of time for operation of scheme.

18. Co-operation of the responsible Authority with the owners of land included in the scheme or other persons interested by means of conferences, etc.

19. Charging on the inheritance of any land, the value of which is increased by the operation of a Town Planning scheme, the sum required to be paid in respect of that increase, and for that purpose applying, with the necessary adaptations, the provisions of any enactments dealing with charges for improvements of land.

(b)

The general provisions have not yet been issued, but the *Procedure Regulations*, which were published in May, 1910, and revised in February, 1914, describe the maps and information required. The whole of the clauses need careful consideration by officials making applications to the Local Government Board, but the following parts of the 1914 Regulations are quoted here for the sake of the technical points they suggest :—

“ *Article V.*—In connection with the application for authority to prepare a scheme the local authority shall furnish the Board with the documents, statements, and other particulars and information hereinafter indicated :—

\* \* \*

“ (d) Information as to the acreage and general character of the land to which the application extends, the extent to which the land is in course of development, the

extent to which the land is likely to be used for building purposes, and, as regards the last-mentioned land, the grounds for considering that the land is likely to be so used.

“(e) The reasons on which the local authority rely in support of their application.

“(f) If the application extends to land already built upon or land not likely to be used for building purposes, the reasons which, in the opinion of the local authority, render it necessary or desirable to include such lands in the proposed scheme ; particulars of the buildings on the lands ; such information as the local authority may be in a position to give in regard to the extent to which it would be necessary to provide for the demolition or alteration of the buildings for the purpose of carrying the proposed scheme into effect ; and, as regards any land not likely to be used for building purposes, the grounds on which it is considered that such land would not be so used.

“(g) Information as to the need for improved means of communication by road in or through the area of the land to which the application extends whether by the widening or improvement of existing roads or the construction of new roads, and as to any proposals for the stopping up or diversion of existing roads or for the allocation of lands for open spaces or for other special purposes.

“(h) Information as to the arrangements in operation in the area of the local authority in regard to sewerage, drainage, and sewage disposal, water supply and lighting, and the like information in regard to the area of any other local authority in which any part of the land to which the application extends is comprised. If any company, whether statutory or otherwise, is supplying or has power to supply water, gas, or electricity in the area of that land, it should be so stated and particulars given in regard thereto.

“(i) If the land to which the application extends is not wholly within the area of the local authority making



the application, information shall be supplied as to the proposals in regard to the authority who are to be responsible for enforcing the observance of the scheme and for the execution of any works which under such scheme, or under Part II. of the Act of 1909, may have to be executed by a local authority.

“(j) Information as to any monuments or ancient monuments, within the meaning of the Ancient Monuments Consolidation and Amendment Act, 1913, situate within the area included in the scheme, and as to the manner in which they would be affected.

“(k) A statement that the land to which the application extends does not include any Crown lands.”

“*Article X.*—When the local authority have fully considered and developed their proposals they shall cause to be printed a draft scheme embodying these proposals, and shall cause a map or, if the case so require, maps (to be marked and known as ‘Map No. 3’ or ‘Map No. 3 (A),’ ‘Map No. 3 (B),’ &c.) to be prepared on a scale of not less than 25·344 inches to the mile, showing clearly by means of boundary lines defined in colour the area of the land included in the proposed scheme distinguishing between the parts of the land included within the area of the local authority and within the area of any other local authority, and also showing thereon all such particulars and details in relation to the proposed scheme as can conveniently be indicated thereon by the aid of reference letters or numbers, descriptive notes, distinguishing colours, or otherwise ; and especially there shall be indicated and distinguished on the said map or maps :—

“ Existing main roads ;

“ Roads repairable by the inhabitants at large ;

“ Roads or footways over which the public have a right-of-way ;

“ Roads on which tramways and light railways (a) have been constructed or (b) are authorised to be constructed ;

“ Roads which the local authority propose shall be made as part of the scheme, indicating the widths thereof and any

proposals as to the parts thereof to be appropriated or set apart for special purposes, and the connections of such roads with existing roads ;

“ Roads or ways which it is proposed to stop up or divert ;

“ Land already built upon ;

“ Land not likely to be used for building purposes ;

“ Land proposed to be allocated for use as open spaces,  
(a) private or (b) public ;

“ Land to be used for any other purposes, including, *e.g.*, buildings for manufacturing purposes or buildings of a special character in reference either to the purposes to which they are to be applied or to their height or otherwise, indicating any restrictions proposed as to the number of buildings which may be erected on any portion of land or each acre in any portion of land ;

“ Land to be acquired by the local authority for any purpose.”

“ *Article XV.*—In connection with an application for the approval of the Board to the scheme as made by the local authority, the local authority shall furnish the Board with the documents, statements, and other particulars and information hereinafter indicated :—

\* \* \*

“ (c) A map on a scale of not less than 25·344 inches to the mile, or a plan drawn to some larger scale (to be marked and known as ‘ Map No. 5 ’) showing the area of the land included in the scheme so divided as to indicate as nearly as may be the portions of such land belonging to different owners. The map or plan shall show as regards each portion of the land, the name of the owner or shall bear numbers having reference to a statement, to be annexed to the map or plan showing the names of the owners.

\* \* \*

“ (f) The names and addresses of the owners of each parcel of the land included in the scheme, and the approximate extent of each such parcel.

“(g) Information to show whether the scheme admits of satisfactory provision being made in regard to the supply of water, gas, or electricity within the area included in the scheme.

“(h) Information in regard to any tramways or light railways constructed or authorised to be constructed in the area included in the scheme or in the immediate neighbourhood thereof.

“(i) Information as to the extent to which it may be contemplated or necessary under the scheme that land shall be acquired by (1) the local authority submitting the scheme or (2) any other local authority, and as to the probability of the lands being acquired by agreement.

“(j) Particulars in regard to any land included in the scheme which belongs to (1) the local authority submitting the scheme or (2) any other local authority ; the purposes for which and the authority under which such land was acquired or is held ; and also information as to any proposal in regard to its use for any other purposes under the scheme.

“(k) If the local authority are of opinion that any property will be injuriously affected by the making of the scheme, within the meaning of the Act of 1909, information, so far as it is practicable to give the same, in regard to such property and as to the extent to which the local authority consider that it may be injuriously affected.

“(l) Detailed particulars of any works which are to be executed under the scheme by any person or local authority, so far as any such particulars are available.

“(m) If the scheme contains provisions suspending any enactment contained in a public general Act, a full explanation of such provisions and the reasons which are considered to justify their insertion.

“(n) If the scheme contains provisions suspending any other statutory enactments, bye-laws, regulations, or other provisions which are in operation in the area included in the scheme, a full explanation of any such provisions and the reasons which are considered to justify their insertion.

“(o) Particulars of any land forming part of any common, open space, or allotment, within the meaning of Section 73 of the Act of 1909, which is within the area included in the scheme, and of any part of that land which under the scheme is authorised to be acquired or appropriated to any other purpose, and particulars in regard to any land proposed to be given in exchange for the land so to be acquired or appropriated.

“(p) Particulars of any land included in the scheme which is situate within the distance prescribed by Regulations made by the Board under Section 74 of the Act of 1909 from any of the royal palaces or parks.”

(c)

The first *International Congress on Town Planning* was held at Ghent during the International Exhibition of 1913.

There were two principal sections, one dealing with the Construction of Towns and the other occupied with the Organisation of Town Life. Both sections were sub-divided and the headings of the programme of the first sub-section were as follows :—

*(Author's Translation and Abridgment.)*

*A. Construction of New Quarters of the Town.*

1. General principles of growth and planning.
2. The dimensions, directions, and types of streets.
3. Open spaces of various kinds.
4. Public buildings, their position and grouping.
5. Buildings and building regulations.
6. Means of transport—railways and tramways.
7. The various quarters of towns—administrative—business—shopping—residential—working class—factories and shipping—recreation and pleasure.
8. The various classes of towns—garden cities—manufacturing towns—season resorts in picturesque districts—



watering places—modern villages—sea-ports—colonial cities and new towns.

Section B dealt with the improvement of the central portions of existing towns.

(d)

In December, 1913, the *Institution of Municipal and County Engineers* issued a syllabus for the optional subject of Town Planning which is to be added to their examination. The syllabus is very short, as various subjects which are necessary to the town planner are already included in the examination of the Institution.

1. A general knowledge of the Town Planning portion of the *Housing and Town Planning, etc., Act, 1909*, and the Local Government Board *Regulations* thereunder with regard to the preparation of a Town Planning scheme.

2. *Suitability* of area for Town Planning.

3. *Natural features*, consideration of drainage, preservation of forest trees, etc.

4. *Buildings*, allocation of areas for dwelling-houses (sites and number per acre), shops, factories, protection from noxious trades, from obstructive buildings, etc. ; protection of ancient buildings and monuments.

5. *Building Lines*.

6. *Streets*, arterial and subsidiary or estate streets, their direction and design in relation to traffic and configuration of the ground, and their embellishment.

7. Provision of *parks, open spaces, playing fields*, and *allotments*, disposition and size in regard to the area of the scheme and the nature of the locality.

(e)

Liverpool University established a department of Civic Design in 1909, before the passing of the Housing and Town Planning Act, and has organised courses of lectures and studio work. There are Professors and Lecturers on Architecture, Civic Design, Civic Engineering, Civic Hygiene, Civic Law, and Landscape Design.

Certificates and Diplomas are given to students who have done satisfactory work during one or two years and pass the examinations.

Birmingham University has appointed a Lecturer on Town Planning, who has given short courses during the past two years.

London University in 1912 organised a Summer School of Town Planning held for a few weeks in August each year. In June, 1914, the University proceeded to the appointment of a Professor of Town Planning, who will work in conjunction with the existing Professors of Architecture and Municipal Engineering.

## RESOLUTIONS PASSED AT ROAD CONGRESSES.

At the International Road Congress held in London in 1913 a number of reports were presented which dealt specially with the Planning of New Streets and Roads. At the previous Congresses there was no section on Town Planning, but there were resolutions with reference to the planting of trees along roads.

*Paris, 1908.*

“It is desirable that the sides of roads should be clearly defined as much as possible by trees.”

“Planting of trees along the roads is also worthy of encouragement from the point of view of the suppression of dust.”

*Brussels, 1910.*

A resolution that “trees should only be planted on urban roadways when the foot pavements of the latter are at least 5 metres wide” was discussed, but not carried. The following resolution was passed :—

“Trees planted in the footways in urban districts should be chosen so as not to inconvenience the frontagers by their leaves nor to interfere by their roots with the distribution systems.”

*London, 1913.*

1. As a general principle, it is better that new main roads be constructed to pass outside rather than through towns, and that, where an existing main road passing through a town is unsatisfactory for through traffic, it is often better in preference to widening an existing narrow main road through the centre of a town, new roads should be planned according to the principles of the science of Town Planning.

2. Gradients on new roads should be as easy as possible having regard to the physical character of the country through which they pass, and they should be easier where there are curves, trams, or a preponderance of heavy traffic.

3. The radii of curves in roads used by fast traffic should, where practicable, provide the best possible and an unobstructed view, and that where this is not possible, the curve being of too short a radius, means should be provided whereby the approach thereto is in some way clearly indicated.

4. Except where it is possible to provide special reserved spaces, tram tracks are best placed in the centre of the roads, and that where so placed it is desirable to provide space on either side for two tracks for vehicles.

5. The main traffic roads should be so designed that spaces are provided for tram tracks, fast and slow traffic, and standing vehicles ; and in such a way that they can proceed without unduly intermixing. In fixing building lines along what may ultimately become main roads, regard should be paid to ultimate requirements. Adequate space should be provided between the buildings, and powers for enforcing this should be held by all authorities who decide the widths of roads.

6. That the planning of main road communication outside towns should be at once undertaken ; it is a matter of national importance in regard to which some initiative should rest with a Central State Authority, and the action of Local Authorities should to some extent be regulated or supervised by Central State Authorities.

## APPENDIX IV.

BOOKS AND PAPERS ON TOWN PLANNING, AND OTHER  
BOOKS CONSULTED OR QUOTED FROM.

MUCH of the literature on the subject of Town Planning is in the form of pamphlets, magazine articles, and papers read at Conferences and the meetings of professional societies.

The following is a short list of books which specially or incidentally deal with Town Planning. The books in (a) have been quoted from\* or otherwise directly used in this Introduction; the books in (b) have not been quoted from, but they are recent publications on Town Planning or some closely allied subject :—

(a)

Author or Translator.	Name of Book.	Publisher, etc.
Wm. Bray. M. Burrows.	<i>Diary of John Evelyn.</i> <i>The Cinque Ports.</i>	Bickers & Son, 1879. Historic Towns Series, Seeley & Co.
E. Cary.	<i>Herodotus.</i>	Bohn's Library. Bell & Son.
Thos. Clarkson.	<i>Life of Penn.</i>	Bradshaw & Black- rock, 1849.
Defoe. (?) Mrs. J. R. Green.	<i>The Fire of London.</i> <i>Town Life in 15th</i> <i>Century.</i>	Bohn's Library. Macmillan.
J. Gwilt.	<i>Vitruvius' Architecture.</i>	Weale's Series.
P. Holland. Dean Kitchin. W. H. Lindley.	<i>Suetonius.</i> <i>Winchester.</i> <i>Municipal Engineering</i> <i>on the Continent.</i>	Crosby Lockwood. D. Nutt. Historic Towns Series. Transactions, Junior Engineers, 1904-5.

\* Where quotations have been made from *newspapers*, the reference is given in footnotes.



## (a)—Continued.

Author or Translator.	Name of Book.	Publisher, etc.
H. S. Lunn.	<i>Municipal Lessons from Southern Germany.</i>	Fisher Unwin, 1908.
Langhorne.	<i>Plutarch's Lives.</i>	W. Scott.
Mulhall.	<i>Dictionary of Statistics.</i>	Routledge, 1899.
Poor Law Commissioners.	<i>Report on Sanitary Condition of Labouring Population.</i>	W. Clowes & Son, 1842.
J. L. Porter.	<i>Giant Cities of Bashan..</i>	Nelson & Sons, 1865.
R. H. Schauffler.	<i>Romantic Germany.</i>	Hutchinson & Co.
C. Seignobos.	<i>History of Ancient Civilisation.</i>	Fisher Unwin, 1907.
Spillan.	<i>Livy's History of Rome.</i>	Bohn's Library.
R. L. Stevenson.	<i>Edinburgh.</i>	Seeley & Co.
C. B. Todd.	<i>The Story of Washington.</i>	Putnam, 1899.
R. Unwin.	<i>Nothing Gained by Overcrowding.</i>	P. S. King & Son, 1912.
A. W. Ward.	<i>Curtius' History of Greece.</i>	Bentley & Son, 1869.
—	<i>Tacitus' Annals.</i>	Bohn's Library.
Also	<i>Census Reports, Acts of Parliament, etc.</i>	Government Publications.

## (b)

Author.	Name of Book.	Publisher and Price.
H. Barlow.	<i>The Law Relating to Town Planning.</i>	Eyre & Spottiswoode. 6s. 6d.
Glen & Dean.	<i>Town Planning Law and Practice.</i>	Shaw & Sons. 15s.
T. C. Horsfall.	<i>The Example of Germany.</i>	Manchester University Press. 2s.
W. R. Lethaby.	<i>Architecture.</i>	Home University Library. 1s.
T. Mawson.	<i>Civic Art.</i>	Batsford. 60s.
J. S. Nettlefold.	<i>Practical Housing.</i>	Garden City Press. 1s.
C. M. Purdom.	<i>The Garden City.</i>	Dent. 10s.
A. R. Sennett.	<i>Garden Cities in Theory and Practice.</i>	Bemrose. 21s.
W. Thompson.	<i>Housing Handbook.</i>	P. S. King & Son. 6s.
Inigo Triggs.	<i>Town Planning, Past, Present, and Future.</i>	Methuen. 15s.
R. Unwin.	<i>Town Planning in Practice.</i>	Fisher Unwin. 21s.

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